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THE AUTUMNAL FEVERS OF THE SOUTHERN ATLANTIC STATES AND THEIR TREATMENT.

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Fever of a malarial origin is an annual visitant, from August to the middle of October, of all that vast section comprised within the Southern Atlantic and Gulf States, and also of a large portion of the interior, comprising the Middle, Western and Southern States. The large number of cases occurring within the vast area comprised within these borders, the distress of mind and body, the loss of time by sickness, the additional expense incurred, the impairment of health and the greatest of earthly evils, the mortality resulting, combine to render this one of the most important and interesting subjects in our profession, and how successfully to prevent malarial infection and to correct it after it enters the human system, become questions of paramount importance.

While this subject has for years received the closest attention from scientific and practical minds, it never loses interest or grows trite and in all probability it never will.

As already stated autumnal fever is an annual visitant in the eastern section of the United States and in certain cases passed under the name of malarial fever and in certain other cases under that of typhoid fever. I find that this fever makes its appearance in our section about August 10 or 15 and continues to prevail until killing frost or freezing temperature begins and then it as suddenly disappears as it appears. I find also among the profession and among the people that this fever in its simple, uncomplicated state goes under the name of malarial fever, while in its complicated state and in its advanced stages it is denominated typhoid fever. Hence, in all cases of malarial fever, characterized by symptoms of malignancy, as a dry tongue, delirium, jactitation, insomnia, tympanites, frequent pulse and general prostration are always miscalled typhoid, and by some typho-malarial fever. These misnomers and misunderstandings of the proper character of autumnal fever are very misleading in relation to our proper conception of the treatment and management of the disease.

In this fever which annually visits our section I do not believe that there is one case in twenty which is genuine typhoid or enteric fever, for these autumnal fevers, however they may in certain cases simulate true typhoid, disappear from our country at the first heavy frost, to return again at the next autumn. This is not the course, or a part of the history of true typhoid fever. Typhoid fever does not come in hot seasons and go in the cold, when frost and ice begin to make their appearance. Typhoid fever does not come when the temperature goes up to 80 or 90 degrees and disappear when it goes down to 32 degrees. But rather typhoid is a disease prevalent in low temperatures, in the late months of winter and early months of spring. On the contrary, malaria thrives, flourishes and grows in high temperatures and moist seasons, in flat, low localities. Typhoid fever has its favorite homes in high, cool localities in northern and mountainous sections.

Etiology of autumnal fevers.—The question of the origin of malaria, which is the true cause of our autumnal fevers, and of its peculiar nature, is now so well settled by scientific investigation it is unnecessary to discuss. The plasmodium malariæ of Laveran, so clearly described by that careful investigator, its parasitic nature, its vegetable origin, its entrance into the circulation, its fastening itself on the red blood corpuscles as any other parasite, its growth and development in those corpuscles, its nourishment and sustenance on the material of the corpuscles, and finally its destruction of the red corpuscles, as any other parasite would do when fastened on an animal or vegetable body. This destruction of the red corpuscles of the blood explains many, if not all, of the pathologic changes resulting from malaria, as organic changes in the liver, spleen, blood and venous tissues. It explains the chills, the fevers, the congestions and irregularities of circulation of malarial fever. The circulation can not pursue its regular course through the round of the vascular system with disorganized, broken down blood corpuscles. They lodge somewhere in the capillaries and cause local congestion in the lungs, liver, spleen or brain. This is the true secret of those terrible congestive or pernicious fevers found in malarial regions. The corpuscles of the blood have been either partially or wholly disorganized and are unfit for circulation through the capillaries. The fever that follows the chill is a bold and determined effort of nature to assert itself and relieve a congested circulation. The chill is a partial cessation or suspension of circulation from partially disorganized blood structure. The fever that follows is necessary to correct that suspension and restore the equilibrium. If there was no fever to follow the chill of malarial fever, the circulation in its integrity and equality could never be restored and in every case there would remain local congestions of the great central organs as the brain, liver, lungs, spleen, that would inevitably produce disorganization of that organ and certain death. The pernicious fever is an example in point. Here there is no reaction, or only a partial reaction, and the result is almost certain death. After the seven days' battle around Richmond, in 1862, I saw cases of this

fever, contracted in the Chicahominy swamps, die within fifteen hours after the first chill.

The plasmodium malariæ of Laveran is probably the most certain diagnostic of malaria when found in the blood.

Another very interesting question in this connection is the channel through which the malarial plasmodium is carried and conveyed into the system, whether through the atmosphere, or water, or both. Formerly it was the professional opinion that the air was the channel through which it was conveyed. At present the trend of professional opinion tends to the view that water is the principal channel. Experiments instituted by many observers in many localities go to show that water certainly is a common carrier of the malarial parasite. These experiments show that in malarial regions persons using surface water, as that of spring or wells or streams, are exceedingly subject to malarial poisoning, while the same persons when made to use water from the deep reservoirs of the earth, as for instance from artesian wells, are entirely free of all malarial infection. In other words, that it is the water from the earth's surface saturated with the debris of vegetable decomposition that contains and carries the malarial parasite.

The importance of these facts elicited by scientific investigation can not be overestimated in a sanitary point of view. But I must think that there is certainly some truth also in the idea that was entertained for so long a time, that the air is a carrier of malaria.

I believe that there is some ground for the opinion that there are different forms of the plasmodium malariæ to account for the different types of malarial fever and that these different types of disease are not simply due to a difference in quantity of the dose.

Forms of malarial fever.—The time honored division of malarial fever into three distinct forms of the disease, the intermittent, remittent and pernicious or congestive, still holds good. But there is a subdivision of the remittent form into two distinct types, the acute, sudden and violent, and the slow, progressive and insidious type.

This division of the remittent form into two distinct types I consider of so much importance that I shall, when I come to consider that form, dwell upon it at some length.

Intermittent fever or fever and ague.—Fever and ague usually runs a distinct course, and is rarely disposed to run into the remittent. At certain seasons it becomes unusually prevalent in the section of the Southern Atlantic States. Then again it may disappear and scarcely be seen for several years.

It is rarely seen in the thickly settled or central portions of towns and cities or thickly populated, well watered, and well drained countries. Its favorite localities are the suburbs of towns, low, swampy regions, supplied with bad drinking water from shallow wells, springs and streams containing vegetable matter. Persons using boiled water, cistern water, artesian water, or well filtered water rarely suffer, if at all, from fever and ague.

The plasmodium of fever and ague appear to have a positive tendency to infect the liver and spleen. And it is after a time very certain to fasten itself on the red corpuscles of the blood. The habitual subject of fever and ague ever presents an appearance highly characteristic of the disease. The complexion at once combines the jaundiced appearance of hepatic disease, and the extreme pallor of profound anemia, showing the poisonous action of malaria on the structure of the liver and at the same time the disorganizing action of the plasmodium on the blood corpuscles. Thus we have in these cases a combination of jaundice and anemia.

There is a peculiarity about fever and ague that has never been accounted for, which differs entirely from the remittent and that is a constant tendency to recur, even long after the subject has ceased to reside in a malarial region. The question is, does he get a new dose of the poison, or does the malarial germs possess the power of generation and multiplication within the system, similar to other ferments and spores? I myself take the latter view of the case. Otherwise I do not see how this peculiarity can be accounted for.

The acute type of remittent malarial fever.—The acute form of malarial fever begins suddenly while the patient is in his usual health. It has no premonitory symptoms. The victim may be in a perfect state of health and be stricken down within a few minutes. It is almost invariably ushered in by a distinct chill or chilliness. The temperature after reaction begins, rises rapidly, advancing to 103 or 104 degrees, even to 105 degrees, within a few hours. Then in the course of ten or twelve hours remission commences. There is a diurnal rhythmic movement of fever. In all of these malarial fevers, there will be observed a rhythmic element except the pernicious, in which it is absent.

In pernicious fevers there is no well defined or regular rhythmic movement in febrile action whatever. Rhythm in fever is a conservative action and an effort of safety and is designed on the part of nature as a protective measure to the patient. It is an alternation of rise and fall of corporeal temperature, solely brought about by the conservative forces of nature. Deprived of this rhythmical tendency in fever we would either have a continual high temperature or low temperature. In our treatment of fever we attempt to imitate the rhythmic action of nature by medical agencies. Chill in fever is a partial suspension of nerve force by the action of certain poisons on the blood and tissue, whether from malaria, sepsis or other causes, in which the circulation is partially and in fatal cases wholly suspended, and for the time the blood-making and heat-generating powers are also in partial suspense. Chill, whether slight or grave, means blood poisoning. The fever that follows, which we term *reaction*, is an effort of nature to restore nervous and circulatory action and throw off the offending cause and is therefore a conservative movement. The chill, the fever and remission, constitute the rhythmic movement of malarial fever, and when we see in our cases of malarial fever this rhythmic action carried out in perfection, we prognosticate a favorable result. But when on the contrary we observe an absence of regular rhythmic action in our cases we argue unfavorable result, provided we can not restore the rhythm of fever by artificial means. Rhythmic movement of temperature is peculiarly characteristic of malarial fevers and is generally known under the term periodicity. But it is not confined to those forms of fevers. We see it in typhoid to a certain extent, but much less defined. We see it clearly defined in hectic and pyemic fever. Here it is again evidence of a poison acting on the blood, depressing the nervous system to an extreme degree, lowering the temperature and reducing the circulation, which we

term a chill. Then follows febrile reaction, which is a vain effort of nature to reassert itself and throw off the effects of blood poisoning, and failing in this then comes the copious perspiration in the further vain effort to get rid of the poison, and finally comes after all this the blessed calm of remission, when the rhythm of fever for a time has been accomplished, with its delightful sensations of relief from the torture and suffering of fever.

Prolonged malarial fever.—This is a distinct type from the acute form of malarial fever. It differs in having a well marked, well defined premonitory stage, which the other has not. This premonitory stage may be developing for a week or more and consists in general sensations of malaise. There is impairment of appetite, some daily headache, some painful sensations in the back and limbs. These symptoms are particulary apt to return toward evening. The victim always feels more or less relief in the morning. Toward night if the pulse and temperature are tested it will be found that they are slightly above, the pulse may rise to 85 and the temperature to 99.5 degrees. Nevertheless the patient continues to be up and about, though he feels there is a loss of physical strength and mental activity, and that he is incapable of much exertion. Toward evening the patient has sensations of chilliness. There is rarely diarrhea present.

These prodromic symptoms resemble very decidedly those of typhoid fever, except that of diarrhea, which is almost invariably present in the latter. But if closely observed it will be found that the prodromic symptoms of prolonged malarial fever increase in severity daily until the full development of the case. There is a daily but very slight increase of temperature and pulse rate, while the patient grows weaker and more indisposed to exertion of any kind.

Finally, there is entire loss of appetite; then there is an evening chilliness and fever, and toward morning a remission, when the patient feels better and stronger during the morning, but as certain as evening approaches there is a return of chilliness, feverishness and decline of strength. It will be observed that at this early stage the rhythm of fever is present and this is characteristic of this fever until it reaches the adynamic stage, when the type of fever assumes a more continuous form and loses the rhythmic character. I regard a proper conception and knowledge of the prolonged form of malarial fever as of exceeding importance, as it is often confounded with genuine typhoid fever. A mistake of this kind is exceedingly unfortunate, as the treatment of the two diseases is entirely distinct.

At the meeting of the Pan-American Medical Congress held in the City of Washington, some years ago, a most instructive and interesting paper was read by Dr. Lobos of Carraccas in Venezuela, on the subject of "Prolonged Malarial Fever" as observed by him in the Tropics, where typhoid is rarely found.

He states that this type of malarial fever, which he regarded as a distinct form, prevailed annually in his section of Central America. The development and progress of the disease are so graphically described by him were eminently slow. It is a fever, while characterized by frequent changes, subject to extreme exacerbation and extreme increase and decline of temperature, often continues for three or four months.

The prolonged malarial remittent fever of our Southern Atlantic States, as witnessed by me for many years past, has three distinct stages, the premonitory preceding the development of fever, the simple febrile stage and finally the true adynamic stage. This is the form of fever we so commonly meet with from July to October in our Southern States, which prevails annually during that period and suddenly disappears when the temperature falls to 32 degrees.

The curves of temperature in the acute and prolonged forms differs widely. In the acute they are sudden, sharp, abrupt and extreme. In the prolonged forms they are slight, gentle, moderate and never sudden, sharp or abrupt. The rise of temperature is gradual and slow and never reaches suddenly a high point. In neglected or improperly treated cases there is a gradual increase daily in temperature until the case reaches the true adynamic stage, when it may attain 105 or 106 degrees. But these high degrees are never attained in the early stages of prolonged fever, but only in the advanced or adynamic.

The premonitory stage.—The premonitory stage is characterized by a decline in physical strength and mental activity. The victim suffers from languor of mind and body. There is a decline correspondingly in appetite. There are neuralgic pains in the limbs, back and head, due to the action of malarial poison on the great nervous centers, the brain and spinal cord.

The premonitory stage of prolonged malarial fever is always characterized by neuralgic manifestations, and these neuralgic symptoms bear out the rhythmic habits of malarial disease. They have their exacerbations and remissions with much regularity. These neuralgias of the premonitory stage of malarial fever are not infrequently mistaken for muscular rheumatism, the effects of cold or simple neuralgic pains. In this stage neuralgic symptoms are often of so marked a character as to obscure all other morbid indications. They may appear in the head, neck, back and limbs. From an early period the poison of malaria makes a marked impression on the sensitive centers of the spinal cord. Its effects on these centers is to produce a state of hyperesthesia or increased sensibility running into neuralgic forms. Whereas the poison of typhoid exerts a contrary effect by producing rather a state of anesthesia of the nervous centers. Nervous sensibility in typhoid is always impaired, blunted and below par. Hence the poison of typhoid exerts a marked sedative on the brain and spinal cord. The premonitory stage of prolonged remittent fever usually continues from five to ten days before the development of the febrile stage.

Secondary or febrile stage.—The appearance of chilliness and fever decides the import of the premonitory symptoms. It decides that they are the prevailing symptoms that usher in an attack of fever. Fever of this type is rarely ushered in by a decided or marked chill, but rather by chilliness at evening. Following this chilliness there is a slight rise of temperature, at first usually 100 or 101 degrees. Toward morning this declines to 99 or 99.5 degrees. For a week or ten days there is an evening chilliness, then a slight rise of temperature, continuing during the night, which declines toward morning. This is the true rhythm of fever constituting exacerbations and remissions. The curves of temperature at this stage are never abrupt, sharp or extreme, but gentle, gradual and slight. The rise will rarely exceed 102 degrees or the fall decline to 99.5 degrees.

The simple febrile stage, if unrestrained, about the third week usually begins to assume a decidedly aggravated form. Then during the febrile exacerbations the temperature rises, the pulse becomes more frequent, the tongue dryer, the appetite is lost, the sleep is disturbed and less refreshing, the mental powers are less clear. These symptoms all denote the approach of the adynamic stage. This is the stage of mortality in prolonged malarial fever. I have never known a case to terminate fatally in the simple, uncomplicated febrile stage. This is the stage in which question of the life or death of the patient are to be determined. The case must reach and pass into the adynamic stage before a fatal termination. Hence the infinite importance of averting this stage. So long as we can avert the adynamic stage our patient is safe. Insomnia, restlessness and delirium constitute early indications of adynamia, that should enlist our attention. In adynamia the blood and nervous system are profoundly affected, there are degenerative actions at work in both, calculated to destroy life. I am persuaded the great system of sympathetic and vasomotor nerves participate in this degenerative action, which explains many of the morbid phenomena of circulatory irregularities of fever.

In the adynamic stage the rhythmic movements grow less and less daily and are less defined. The febrile type gradually loses the remittent form and assumes the continued. Delirium becomes a constant feature. The rest of the patient is seriously impaired and marked insomnia sets in. The tongue becomes dry, crusty, red or dark brown. In place of tympanites there is often retraction of the abdominal walls and in very protracted cases the spinal column may be detected through the abdomen. The pulse increases in frequency and the temperature from 104 to 105 degrees. By the end of the fourth week the temperature will range at about 105 degrees, and the pulse rate at 125 or 130. Hence the extent and gravity of adynamia in this form indicate the degree of degenerative action in the blood and tissues. After the adynamic stage sets in then recovery can only take place after such changes or their effects have been repaired by nature. It is this stage of adynamia which all cases of prolonged malarial fever when neglected or ill treated pass through, that induces the belief in many that it is true typhoid fever, while others regard it as a combination of typhoid and malarial fever or what is termed by many typho-malarial fever, which is evidently a misnomer, as there is no such disease. It is simply a case of prolonged malarial fever that has passed into the adynamic stage.

The habitat of prolonged malarial fever.—As we advance from the more temperate climates toward the warm and tropical regions this form of disease becomes more prevalent, until we reach a point where it is the endemic of the country, and this is in the region of the Central American States. Dr. Lobos tell us in his very interesting paper that it is endemic in Venezuela, and as witnessed by him it assumes a very protracted form, often continuing three or four months. The idea which I desire to inculcate here is that as we advance toward the tropics, the tendency to the prolonged form increases until we reach a point where the protracted form is the prevailing type of malarial disease.

In the Southern Atlantic States the disease usually runs a course of from three to six weeks. In the tropics from three to four months, according to Dr. Lobos.

Pernicious or congestive fever.—This form of fever is not infrequently seen in the lower Atlantic and Gulf States during the autumn months. It is noted for the suddenness of its onset, the rapidity of its course and termination. Its chief characteristics are sudden chill protracted over many hours, either without reaction or followed by very imperfect reaction. In this imperfect reaction the head and body may be intensely hot while the extremities have the coolness of death. I have seen cases of this fever in which the extremities and surface were icy cold, while the thermometer in the rectum denoted 106.5 degrees.

Malarial coma is a frequent feature of these cases. The pupils are widely dilated; the tongue is cold and very pallid. In some cases there is intense nausea and vomiting. At times the pulse is slow, at others rapid and very feeble. The cardiac sounds are very indistinct and scarcely audible. Hematuria is not an infrequent symptom, and albumin is often found in the urine.

The degree of malignancy of pernicious fever must be regarded as the measure of the extent to which the corpuscles of the blood have been disorganized or destroyed by the plasmodium malariæ. It is difficult to say what proportion of these corpuscles may be disorganized without producing fatal results, whether a fourth or a third or a half. But in pernicious fever a very large proportion of blood corpuscles must speedily be rendered unfit for circulation and purposes of life. It is altogether probable that the peculiar phenomena of this fever are due to this pathologic fact. The prolonged chill, the extreme reduction of temperature, the imperfect reaction, and finally the intense and extensive congestion of the internal organs, are all due to the fact that the blood corpuscles to a large extent have been disorganized by the malarial parasite or have lost their amebic characteristics and find fixed lodgment in the capillaries of the internal organs, as the lungs, liver and spleen, and in these organs cause irremediable congestion. In those cases where reaction and restoration took place, what becomes of the débris of those broken down corpuscles is an interesting question. They exist in the congested organs as effete material that must be gotten rid of before there can be a restoration to health. To convert this effete matter into new forms, fitting it for elimination from the system, becomes the work of that potent agent, oxygen. By the action of this wonderful agent, the débris of broken down corpuscles is converted into urea, uric acid, creatin and creatinin, forms perfectly adapted for elimination by the renal organs.

True congestive fever, like cholera, is a disease rapid in its incipiency, rapid in its onset, rapid in its course and sudden in its termination when fatal, and treatment, to avail anything, must be prompt, as every minute counts for much in arresting its progress. A marked feature in pernicious congestive fever is malarial coma. This symptom usually sets in when the algid stage is at its climax. It is often impossible to arouse the patient. The pupil refuses to respond to light. The powers of sensation are often lost. You may handle many of these patients rudely and roughly, you may prick them with a sharp instrument, and the nervous system fails to respond. The nervous centers are profoundly intoxicated with the malarial poison. Yet the coma of malaria resembles neither the coma of apoplexy or of uremia. It is wanting in the stertorous breathing and hemiplegic symptoms of the

former and the convulsive features of the latter. The patient is in an apparent profound, quiet sleep. The breathing is slow and labored.

The prognosis of pernicious congestive fever is always bad. A certain proportion of these cases die and never react, after the first chill. Another proportion die during the second and third chill. But as a rule, these latter cases never fairly and fully react. If the patient only partially reacts after the first chill and suffers a second chill, he generally succumbs in the second. In many of these cases such is the extent of disorganization of blood corpuscles from the first onset, the case is fatal from the beginning and is beyond the reach of remedies.

The rate of mortality is always very high. It ranges from 50 to 60 per cent.

Differentiation between the symptoms of typhoid and prolonged malarial fever. — In differentiating between the symptoms of the two diseases, the curves in the temperature of the two forms are really almost if not in perfect resemblance. The prodromic symptoms, while alike in some particulars, are dissimilar in others.

During the prodromic stage of prolonged malarial fever there are always present decided neuralgic features common to malarial poisoning. These are almost invariably absent in typhoid fever.

In typhoid, diarrhea is invariably present. In malarial fever the opposite is usually the case. In typhoid fever there can usually be detected on pressure in the right iliac region, distinct gurgling. The rose-colored eruption over the abdomen is usually present in typhoid, and absent in malarial fever. Tympanites is invariably present in the second stage of typhoid and absent in malarial fever. In the latter a state of retraction of the abdominal walls usually exists throughout its progress. Hemorrhage is a not infrequent occurrence in typhoid fever, and is never present in malarial fever.

But the most characteristic difference is found in the presence of the malarial parasite. The presence of this body at once is sufficient to determine the nature of the case.

It will not do in these cases to depend upon the curves of temperature as a means of differentiation. I see cases of prolonged malarial fever every season in which these curves resemble perfectly those of typhoid. They possess all their gentleness, their slightness, their evenness, slowness, similar to typhoid fever. They have none of the sharpness, suddenness, abruptness or extreme character of acute malarial fever. The rise and fall of temperature is moderate, never sudden, abrupt or extreme throughout. In this way the curves of temperature in the prolonged variety are often deceptive and misleading.

A large majority of medical men of my acquaintance, as a matter of differentiation between prolonged malarial fever and typhoid depend largely on the character of the curves of temperature.

Another feature very much depended on for diagnosis is the continued form of fever assumed by malarial fever in the adynamic stage. These are all deceptive and fallacious tests. I regard the proper differentiation between the prolonged form of malarial fever and typhoid as a matter of infinite importance, as the treatment of the two diseases is entirely distinct, and as a question that can only be settled by the microscope.

TREATMENT OF AUTUMNAL FEVERS.

I know of no subject in the practice of medicine, with the exception of typhoid fever or tubercular phthisis, of more importance and that merits our careful and scientific consideration more closely than that of the treatment of the autumnal fevers of our country. These forms are not only an annual visitant of the Atlantic States of the South, but their visitation always brings distress, trouble, suffering and too often death, and may ever be regarded in the light of a calamity.

Prophylaxis.—It is conceded by all authorities that malaria enters the human system either by means of the air we breathe or the water we drink, or through both of the channels. For many years it was the accepted opinion that the air was the only common carrier of malaria. More recently carefully conducted experiments go to prove that water is the true carrier of malaria. If this be true it is obvious that we have at hand a far greater command of the situation in instituting measures for the protection of the human system against malarial poisoning. Frost and malaria are deadly enemies. When water sinks in its temperature to 32 degrees F. all malarial germination and life ceases, and after that water in the most malarial districts may be imbibed with impunity. Our water supply, according to the latest and most reliable scientific experiments, is to be the field of future hygienic investigation and operation in regard to the question of malaria and its entrance into the human system. Formerly drainage, the clearing up of swamp lands, tillage and improvement of the soil were the only hope of those residing in malarial districts. Since the discovery that water, if not the chief, is a common carrier of malaria, another and a renewed hope has arisen for those who are yearly subject to malarial influences and that hope lies in a supply of purified water. If this be true, and all the evidences point in that direction, those who reside in the most deadly malarial districts may not despair, for by a little expense and not much labor, they can command the situation. It is very well established that malarial infected water is confined to that on or near the surface of the earth. The deep reservoirs of the earth, which can only be penetrated by artesian wells, are free from malaria. But the expense of this resource renders it impracticable in many sections. But a resource available for the poorest and humblest in malarial regions is that of *sterilized water*, which has been subjected to the boiling point. But sterilized water, while its malarial parasites have been killed by the action of heat, nevertheless contains a certain amount of dead organic matter. From this objectionable element sterilized water can be made free by filtration.

Certain products of cinchona undoubtedly possess prophylactic power in addition to their curative properties. Quinin, its most important product, must be regarded, in addition to its multiplicity of medicinal properties, as an antidote to the malarial poison. And it has a claim to be ranked among the chemic antidotes. It arrests fungoid generation and growth by arresting all fermentative action in the blood. If the article quinin possesses the chemic property of accomplishing these objects it is entitled to be ranked among the antidotes for fungoid growth and fermentative action in the blood.

Its well-known antipyretic powers in fevers are no doubt due to its remarkable antifermentative action.

But regardless of all theory on the subject, well-

attested experiments in its use as a prophylactic in all malarial regions, as the Southern Atlantic and Gulf States, East and West Indies, have established beyond a doubt its prophylactic powers. Ten grains of the bisulphate taken in a glass of sherry wine before breakfast and previous to all exposure, when combined with the systematic use of sterilized water will ensure protection.

I think in filtered sterilized water we have the ideal non-malarial drinking water for common use by residents of malarial districts when other resources, as artesian wells, are impracticable. However much water may be impregnated with the malarial parasite, in sterilization and filtration we have a certain means of purifying it and rendering it fit for human use. By the process of sterilization the vitality of the parasite is destroyed. But that does not remove the dead organic remains from the water. That can only be accomplished by a thorough process of filtration. Hence safety lies in a combination of sterilization and filtration.

The rate of mortality in the prolonged form of malarial fever or the so-called typho-malarial fever, is about equal to that of true typhoid fever. The rate of mortality of pernicious congestive fever is very high. It not infrequently reaches 50 or 60 per cent.

In the treatment of these diseases the important question arises, can we by any known means modify the types of these fevers, by rendering them milder, and at the same time reduce their rate of mortality?

These are questions of paramount importance. I believe that by proper treatment these objects can be accomplished.

Quinin is the only certain and acknowedged antidote to the parasite of malaria.

But its efficiency as such depends absolutely upon the manner of its administration. Given according to rules it is a remedy of great precision. Given according to other methods it is entirely insufficient. There is much in the manner of giving remedies, and even the most valuable and potent may fail if given without proper method or system.

Forty years ago it was the custom to give quinin in malarial fever in doses of one grain every hour, or two grains every two hours, or three grains every three hours. Well do I remember the utter inefficiency of the remedy in modifying the type or reducing the rate of mortality. By this method the system failed to get sufficient of the antidote to destroy the parasite. In giving this antidote it becomes somewhat a question of mathematical calculation. We must gauge the quantity of our antidote to the amount of parasite in the system and the gravity of the case. Not only this, but the remedy should be given in large doses at longer intervals, rather than in small doses at shorter intervals. Thirty grains given in ten-grain doses three times a day is far more efficient in the remittent forms of fever than the same quantity given in two-grain doses every two hours. Twelve-grain doses morning and evening act more decidedly than twenty-four grains divided into broken doses every two hours. In decided forms of fever quinin should never be given in small doses, however often repeated. I have repeatedly seen cases in which one or two grains were given every one or two hours, without the least effect, when the same quantity per diem given in three equal parts three times a day changed the entire aspect of the case promptly.

For many years I have taken every opportunity to experiment with quinin in malarial fevers with a view of ascertaining in each form and stage of fever the quantity of quinin that was necessary to act as a destructive antidote to the malarial parasite.

I found by experiment that in the treatment of intermittent fever fifty grains (gm. 3) of quinin given within thirty-six hours preceding the chill, was the maximum quantity required to arrest the disease. Thirty grains (gm. 1.80) given within twenty-four hours preceding the chill in a majority of cases would arrrest it, but not invariably. I found that five grains (gm. .30) of acetanilid given just before the chill invariably modified the chill and resulting fever. In regard to chronic chill and fever, I found 10 grains (gm. .60) of quinin given in sherry wine before breakfast and Warburg's tincture in full doses after dinner and supper, almost invariably acted as preventives.

Quinin should never be given in pill form as they are slow to dissolve and frequently do not dissolve in the stomach at all. It is preferable to give it in solution or powder as the bisulphate, or lastly in fresh capsules. I am satisfied that a certain proportion of cases are lost because of the insolubility of pills. I have repeatedly seen in my practice cases grow worse daily under the use of the quinin pill, that improved rapidly when the solution or powder was substituted. Then again in cases of great emergency where we desire prompt action, in my experience, the bisulphate is the most certain form in which it can be given.

In the application of this remedy as an antidote to the malarial plasmodium, we must be governed by fixed laws and practical rules, or failure will be the result.

It is certainly true that we have all grades and types of malarial disease from the mildest to the most malignant, and we must adapt our measures to these different grades or we can not have success. I found in my experience in the past thirty years, in about one hundred and seventy-five cases of malarial fever beginning suddenly, with a decided chill and followed by a temperature running up rapidly to 105 or 106 degrees, with intense neuralgic pains, 60 grains (gm. 3.60) of quinin per day of twenty-four hours given in divided doses of 10 grains (.60) every four hours would invariably arrest the attack in seventy-two hours and frequently less time. Thirty grains per day would prolong the attack to five or six days, especially if given in three grain doses every two hours. Twenty grains (gm. 1.20) per day would prolong the attack between one and two weeks, and 15 (.90) per day would prolong it from three to four weeks.

These facts teach us the important lesson, that to obtain the full antidotal effects of quinin, we must saturate the system with the remedial agent promptly in quantities sufficient to kill every malarial germ in the system. Otherwise if a single germ is left in a living state it becomes the nucleus for rapid germination and multiplication, and our work must be done over again.

The question arises whether in these violent types of high temperature, we have any means at hand to facilitate or promote the action of quinin. I can answer this question emphatically in the affirmative. I find that during the febrile exacerbation when the temperature is high, the skin is very dry, the pulse frequent, 5 grs. (.30) of phenacetin, and 3 (.18) of acetanilid given every two hours act charmingly in lowering temperature, composing excitement, and inducing perspiration and in this way aiding the action of qui-

nin. Then there is the additional means of sponging the surface with cold water and alcohol. But in those cases of hyperpyrexia with a temperature of 106 or 107 degrees threatening a speedy termination of life the cold poultice enveloping the chest, abdomen and spine, and changed every two or three hours has done me most excellent service. Then we have in this class of cases numerous and valuable resources in aiding and facilitating the action of quinin in doing its work.

Next in order to be considered is the treatment of the prolonged variety of malarial fever.

The prolonged form of malarial fever, if neglected or improperly treated, is certain about the third or fourth week to pass into the adynamic stage.

The questions arising in treating this form of fever are, whether its type can be modified, its progress curtailed, and the adynamic stage be averted.

I can with the utmost certainty answer this question in the affirmative. But in our treatment we have persistent disease to contend with, and our treatment must be systematic, constant and active, and as sure as we lapse into an expectant method, or relax our efforts, the progress of the case gains on us every hour and it will pass into the adynamic stage, there will be increase of temperature, of pulse rate, and the rhythm of fever will disappear and it will assume a continued form, and then the stage of delirium appears, with all other toxic symptoms. If we expect success in our treatment the antidotal treatment must be commenced from the earliest stage, and never relaxed to the end. Twenty grains (1.20) of quinin divided in three equal parts given three times a day will maintain the case in its simple type, keep the temperature down to 101 degrees in the morning and 102 degrees at evening, prevent typhoid symptoms, or other complications and finish up the case about the third or fourth week, but 30 grains (1.80) per day will do much better.

A very interesting fact will be noticed in the therapeutic action of quinin here in its power to preserve the case in its simple rhythmic forms of fever and uncomplicated state, with moderate temperature, with clear mental faculties throughout. Ten grains of bisulphate of quinin three times a day in a case of this kind will usually carry it through a course of two weeks and finish it up in that time.

I am convinced of the importance of the patient having every night for restful sleep. It will be observed that in all of these cases the medicine and nourishment are administered during the day. If signs of insomnia appear the patient invariably has at night a hypodermic of morphia and atropia.

The percentage of mortality in the cases treated by this method did not exceed 2 per cent. In regard to the treatment of the pernicious form of congestive fever, I will briefly cite the history of a case for the purpose of illustration.

Case 1.—Adult aged 30, robust constitution, had a chill which lasted twelve hours before signs of reaction. He was in a profound state of coma. The pulse was exceedingly feeble and very rapid, the temperature under the arm was 90 degrees, in the rectum 106 degrees. The extremities and surface were deathly cold, pupils dilated. Sixty grains (gm. 3.60) of quinin in a half pint of milk punch were injected in the rectum; the fiftieth of a grain (.0012) each of strychnia and glonoin were injected under the skin. Dry heat was abundantly applied to the surface. These remedies were repeated by hypodermic every two hours. In twelve hours signs of reaction began. Consciousness was gradually regained, reactive fever set in, followed by perspiration. The patient had two drams more of quinin, which prevented effectually a return of chill.

I desire here more particularly to mention the action of glonoin in connection with quinin in these cases. Those who have observed the course of pernicious congestive fever have noticed that the blood almost entirely recedes from the surface and extremities to the internal organs. Probably three-fourths of the circulating blood has accumulated in the brain, lungs, liver, spleen and intestines, while the arterioles of the surface are in a state of contraction.

The action of the glonoin is to promply dilate these vessels to invite the circulation back to the surface and extremities and to produce reaction.

The prolonged chill of pernicious fever, and the difficulty of reaction mean the destruction or disorganization of a large proportion of blood corpuscles, and the intense internal congestions mean that these dead or disorganized corpuscles have lodged in the capillaries of the internal organs and are in a state of stasis. Unless nature can again throw these dead and disorganized corpuscles back into the general circulation; which we term reaction, where they may be disintegrated and converted into urea, uric acid, creatin and creatinin, and in this form eliminated from the system the result must be fatal.

Hence all of our endeavors in these cases are to produce speedy reaction, and to destroy the life of the parasite of malaria, and finally to eliminate them from the system.

Tolerance of quinin.—It is surprising how the system comes to tolerate these full doses of quinin when long continued and which are followed by no evil results. I have given continuously for a month 10 grains (.60) three times a day, and after the first few days all unpleasant effects on the nervous system would cease, when there would be a complete state of tolerance, and the remedy would act as a pleasant sedative tonic and antipyretic.

THE RELATION OF THE MEDICAL PROFESSION TO THE PUBLIC.

Annual Address delivered before the Chester County (Pa.) Medical Society, January, 1896.

BY U. GRANT GIFFORD, M.D.

AVONDALE, PA.

The stream rises no higher than its source, the fabric partakes of the color and character of its component fibers; and the medical profession is no exception to this rule.

Certainly it is not to be denied that medicine stands sponsor for much that is intimately associated with human progress, happiness and well-being. We look with satisfaction at the record of medical science and point proudly to her achievements in the relief of human suffering and in the prolongation of human life. Vaccination, anesthesia and antiseptics compare well with any of the discoveries that grace the annals of human progress in any field. Pathology and bacteriology have thrown beneficent light on many of the hidden problems and have placed some of the older tenets of medical faith on a scientific basis. In the virgin but fertile field of preventive medicine a few furrows have been turned, some seed scattered, and the fruit already gathered gives token of an abundant harvest when the field shall have been well tilled. Sanitary measures have been studied and applied,

corrected and classified, until we may speak indeed unblushingly of sanitary science. In addition to these achievements the medical profession dispenses the most abundant (and in the fact that it helps the recipient to help himself) the most wholesome charity of our age.

But while we may be justly proud of the progress of the profession along scientific lines, and of the position it holds in the rapidly advancing civilization of the day, it is by no means without blemish. Evils that should not have an existence in a liberal profession are all too prevalent, and even the most superficial observer must recognize conditions that are a discredit to the profession and that should be corrected. It appears to me that the rattling pace of our closing century civilization exerts a deleterious influence on the *morale* of the profession. It may be because of the increased cost of maintaining a social position suitable to the dignity of the profession, or it may be in sympathy with the general spirit of gold worship and greed that characterizes our times, but for some cause or combination of causes too many members of the profession have lost sight of its true object, and have bowed before a golden idol. There appears to be a growing tendency to measure a man's success in medicine by the size of his income. There could be no greater fallacy, indeed it is more than a fallacy, it is in many cases the diametric opposite of the truth. In too many cases money-getting is the result of the adoption of methods that are contrary to the ethical spirit of the profession, the prostitution of its high office, and the substitution of conscienceless tact for conscientious talent. That a competence is sometimes the reward of honest, conscientious toil in the field of medicine is not to be denied, but when money-getting is the primary aim and motive of a doctor's life, the true interest of the profession must necessarily become a subservient force. In a profession where commercialism has no rightful place, gold may be a result, it can never be a legitimate motive.

There is no question that the laborer in this field is worthy of his hire, nor is it to be denied that the fee may be in proportion to the skill of the laborer and the ability of the employer, but when the physician sees nothing higher in his services than his prospective fee, the transaction is brought down to a purely commercial basis, and it is to be regretted that a man who has no higher incentive should not have entered a field where barter and gain are the recognized purposes. In those cases in whieh honor and riches have alike crowned the closing years of a doctor's life, it is generally observed that his earlier years were spent in arduous scientific work that brought little monetary recompense. In poverty and toil such men have laid the foundation of a success that is not tarnished by mercenary motives nor dimmed by a greed of gold. It may be that the extension of the course of study in the leading medical colleges will in a measure correct this growing evil. The average income of a medical man will scarcely justify, from a commercial standpoint, the investment of from two to three thousand dollars and four years of the most active period of life. At least it is to be hoped that the commercially inclined aspirant for the medical degree will so view the situation. Let us hope that in raising the scientific, the ethical standard may also be improved and that the time may speedily come when we might, without absurdity or incongruity, paraphrase Holy Writ and ask what will it profit a man if he gain wealth and lose his professional honor.

Certainly it would be improper to speak of quackery as a vice of the medical profession, possibly it would be unkind, but candidly have we a better name by which to designate certain practices that we all know are too common. For instance, the habit of exaggerating the importance and gravity of a case, with the result of being credited with a rapid and radical cure of a condition that never existed. It is true that the laity is at all times a willing partner in such deception and lend active ear and tongue to its completion, but the ease and facility with which it may be practiced and the gluttonous gulp with which it is accepted by the public, makes it none the less reprehensible and all the more dangerous. It must be a fascinating study to the psychologist to discover the origin of that form of vanity that finds its gratification in personal abnormalism, or a departure from the accepted standard of physical condition; but who has not heard individuals describe their experience in illness or accident with all the pride and exultation that an old veteran infuses into his account of battles fought and won.

It is said that one of the famous consultants of London was at one time summarily dismissed by a society lady for making in her case a diagnosis of boils and prescribing rest and iron; his professional neighbor receiving profuse thanks and a liberal fee for calling the disorder furuncles and giving directions that the patient at once cancel all social engagements and retire to a fashionable watering place while she should receive a course of ferruginous tonics. The plebeians may have boils, but for the patrician they lack dignity. Tact won the day, plain simple honesty was at a discount. Nor was this an isolated or exceptional case; in some form or other this condition manifests itself in every walk of life and in every grade of society. Dishonest desire loves its dishonest gratification. But in such a compact the physician is accessory only at the expense of honesty and the sacrifice of the high sense that should characterize every member of the profession. "There are no tricks in simple faith." Probably very few of us indeed have not been annoyed at the lack of discrimination on the part of the public in matters pertaining to professional standing, character and ability. To have a patient in whom one is deeply interested, suddenly and without cause leave his care and consult a recognized quack is, to say the least, not very edifying. But there is something in human nature that craves the mysterious. To the laity mysticism and medicine have always had a close affinity and the elimination of the former from the latter has been noted as an index of the advance of human knowledge, but the emancipation is as yet by no means complete. In ancient days, when the priests of the Temple ministered alike to disease of body and soul, we can not marvel that an ignorant populace ascribed all virtues of the healing art to mystic or supernatural causes, but that one hundred years ago the wand of Mesmer could agitate all Paris is more difficult to comprehend and, more difficult still to comprehend, that in our own day the shoemaker Schlatter should be to thousands the efficient embodiment of all that is potent in the healing of human ills. This can only be explained by the existence of a blind, unthinking, ignorant and superstitious credulity on the part of the public. It presents the paradox of the absolutely incredible being the most credible. A willingness to prey upon this has ever been the distinguishing fea-

ture of quackery and desire to turn it to personal gain is always its underlying motive. However this should be the special province of quackery, on which the regular profession has no right to encroach and a privilege we should leave to its exclusive use. But is it? Does the regular profession as steadfastly refuse to invade this territory as the dictates of honor and the dignity of the profession would direct?

If we employ methods that to the untutored mind are scarcely more successful and are prompted by motives no higher, if we prey upon the ignorant credulity of the public as does the irregular and profit by the same deceptions, wherein lies the difference between medicine and quackery? Certainly there is a vast difference in the scientific standing, but this is not enough. In medicine the scientific and ethical should be inseparably blended and if a gullible public fails to discern the difference between science and superstition probably it may find a distinction between honesty and dishonesty. If our methods fail to merit the approval of the masses, probably our motives will make a more successful appeal.

CHAIRMAN'S ADDRESS.

Address of the Chairman delivered in the Section on Dental and Oral Surgery at the Forty-seventh Annual Meeting of the American Medical Association, held at Atlanta, Ga., May 5-8, 1896.

BY R. R. ANDREWS, D.D.S., F.R.M.S.

CAMBRIDGE, MASS.

Permit me at the outset of our meeting, to thank you for the honor you have seen fit to confer upon me. We are here, not for the consideration of the various kindergarten processes which go to make up the ordinary technique of our every-day affairs, but rather for the consideration of the higher themes in the realms of scientific research. Our aim should be to search a little further into the borders of the unknown. Some of the theories of yesterday have crystallized into the facts of today, and the knowledge gained benefits our whole professional brotherhood. One of the evidences of advancement is a growing tendency, particularly in the larger cities among our leading men, who are not wholly satisfied with the average society proceedings, to band themselves together in the formation of the various stomatological associations for the consideration and discussion of questions purely scientific, and their proceedings thus far warrant excellent results. The year has also given us a most valuable and brilliant series of experiments conducted on an accurate scientific basis, by which we know more of the physical properties of the teeth and of the various filling-materials. These are to be noted as added treasures to our common knowledge.

There has also been much thought given to the subject of electric medication. By the latest cataphoric methods extremely sensitive teeth are completely obtunded and those badly discolored are successfully bleached.

Our special schools are constantly advancing their standards, and the graduates are taking a higher ethical and professional standing wherever they go. We look forward to the time when our students shall become the students of a medical university, where all the specialities of the healing arts are taught, and where a common degree shall be given to all. Surely the surgical and medical care of the mouth and its associate parts is as important as that of the ear or eye or other parts requiring medical specialists; and this recalls to my mind the words of an ancient writer, one Apuleius, who, writing in the second century, says: "The mouth requires more sedulous attention than all the rest of the body, seeing that it is the vestibule of the mind, the gateway of speech, and the outer court of the thoughts."

It has been said that a man speaks best when speaking of a subject that is familiar to him. I shall therefore call your attention to the consideration of the finer processes which take place in the building up of enamel. To this subject I have given much thought and original research.

In the February number of the *Dental Cosmos* of the current year was an original communication on the formation and structure of dental enamel, by J. Leon Williams, of London. The paper was read in substance before the Royal Society of Great Britain on December 12, 1895. In this article he advanced new ideas in regard to the finer processes of enamel-formation, and illustrated his paper with reproductions of his photo-micrographs, which are the finest that have ever been shown, or rather the finest that I have even seen.

While fully recognizing the worth of Dr. Williams' investigations in this field, I propose to criticise, in a friendly way, some of his theories, as they differ somewhat from my own conclusions arrived at after giving this subject a good deal of time and careful investigation, while writing my Berlin paper in 1889. In the article to which I have referred, Dr. Williams makes this statement: "The stratum intermedium performs a much more important function in the process of enamel-building than has heretofore been supposed." He calls the reader's attention to the fact, well known before, that between the enamel-cells and the stratum intermedium is seen a narrow band which is clear, sharply marked, and differentiated line separating these two layers of cells which have heretofore always been represented as closely connected. He says that writers of acknowledged authority speak of the ameloblasts as being constantly renewed from the stratum intermedium. He also states that the other end of the ameloblast lying next the forming enamel is also bounded by a similar line. These appearances are not new; they are familiar to all investigators. They have been constantly seen when studying the earlier stages in the growth of the enamel.

The band, or, as he names it, the membrane between the stratum intermedium and the enamel-cells, is not constant. This is clearly seen in several of the illustrations. During the time of my own investigation of the enamel, I gave considerable attention to the consideration of these appearances, and was then led to believe that they were merely stages in the growth of the young tissue. Some sections would show it; in others it was absent, each section showing the picture at the point where death left it. In many of my sections the enamel-cells were in direct contact with the cells of the stratum intermedium; some of them seemed to be actually passing down into the enamel-cells as though they were to become ameloblasts, and there was no appearance of any tissue between them. This is why I think the enamel-cells are supplied from this layer. Others have noted the same appearance.

In a paper read at Chicago, at the late Dental Congress, I demonstrated that there is in the devel-

oping enamel, as had already been found in the developing dentine, a fibrous substructure. I there clearly demonstrated by my photo-micrographs that this fibrous substructure originated either in the cells of the stratum intermedium or from the embryonic connective tissue just beyond. My photographs showed this fibrous tissue bridging the space where I had teased a layer of enamel-cells from the cells of the stratum intermedium. I do not believe there is any such tissue as the membrana preformativa, as described by the earlier investigators. At the inner surface of the enamel-cells toward the enamel, this tissue, under the microscope, has the same appearance as that which is found between the odontoblasts and the formed dentine. It is a layer of a semi-solid gelatinous tissue which investigators have named "border-land tissue," always to be found between the calcified tissue and the cells that form it. This band is so narrow at times that it is scarcely to be seen, and sometimes it is as wide as the layer of cells. As I have stated, these different widths indicate stages in its growth. In the dentine layer are to be found numerous connective tissue fibers, first noticed by Mummery, of London, and into it the matrix-forming material is deposited.

With my present knowledge, I can not consider the layer between the enamel-cells and the enamel a membrane, and indeed Dr. Williams considers it doubtful, for he states that it is impossible at present to speak definitely in regard to its origin, exact structure, or function; but he considers it plays an important part in the elaboration of material for enamel-building. As this is a partially calcified layer composed of globules and cement substance, lifeless material, I fail to see the important part it plays in the elaboration of materials for enamel-building. It is a tissue that has been elaborated by the enamel-cells. Dr. Williams now passes to consider another feature of the enamel-forming organs—the stratum intermedium. He states that these cells have heretofore been supposed to perform no particular function until the formation of the enamel-prisms was completed, when, it is believed, they undergo some modification of form and become calcified as the outer cuticular layer of enamel known as Nasmyth's membrane.

In explaining the origin of this membrane I can not agree with this supposition. Nasmyth's membrane is formed from the layer of ameloblasts left after the enamel is completed.

Dr. Williams says that he is able to show that the cells of the stratum intermedium constitute a no less important factor in the formation of enamel than the ameloblasts; indeed, he says it would appear that they are the more active of the two so far as concerns the selection of the proper material for enamel-building. Again I can not agree with him. The secretion of the proper material, the lime salts, comes from the blood supply everywhere found against the stratum intermedium after calcification commences. This calcific material is absorbed by and only detected in the ameloblast, near its nucleus, as a microscopically minute globule, calco-spherite. The evidence under the highest powers, is, that its formation and growth is within this cell.

As I stated in my Chicago paper, I believe that the cells in the stratum intermedium are the origin of the fibrous substructure which serves as a scaffolding to build up the young enamel. There is a possibility that this fibrous tissue, which I believe I have clearly demonstrated to be present, may originate from the connective tissue of the jaw which is against this layer; in fact, I have been somewhat in doubt whether or no the cells of the connective tissue of the jaw did not take the place of this layer after calcification had advanced, for in many sections it is difficult to distinguish anything but connective tissue cells against the ameloblasts.

Dr. Williams continues, "It has for many years seemed clear to me that the enamel-organ, and more especially the stratum intermedium, should be classed among the true secreting tissues." He states, "I am not able to understand how so many good observers have failed to see the intricate plexus of blood vessels which is very early developed in this layer of cells. Wedl, Magitot, Legros and Sudduth say that they have uniformly failed to detect a blood supply within any part of the enamel-organ proper. And yet in a large majority of my photographs it is as plainly evident as the ameloblasts or the stellate reticulum." Dr. Williams can not mean that there is an intricate plexus of blood vessels developed from the cells of the stratum intermedium, these cells having their origin from an epithelial source. The enamel-organ proper is a closed organ of epithelial tissue, with its central mass of stellate tissue, having lime salts enough within it to form the first layer of enamel. No intricate plexus of blood vessels is ever seen within this epithelial organ at this time. Indications of a blood supply are to be seen just without, but never in or against the stratum intermedium, until the main mass of epithelial cells have disappeared and the connective tissue of the jaw is against the true enamel-forming layers. Dr. Williams' photographs do not show this intricate plexus of blood vessels in the enamel-organ proper.

I can not believe Dr. Williams agrees with Heitzmann and Bödecker in their idea that the stratum intermedium of the enamel-organ is a kind of connective tissue. No, this intricate plexus of blood vessels has its origin in the true connective tissue of the jaw.

I have never studied tissue from the jaw of the mouse or rat, consequently I have never seen the appearance which Dr. Williams illustrates; nor do I believe the tissue of the stratum intermedium, as shown, to be glandular tissue. This vascular network in the stratum intermedium of the rat was seen and described by Professor Rowes and Mr. Poulton, two English observers, some years ago, but they said nothing about its being glandular tissue. In the jaw of the rodent, where the enamel is being constantly supplied as it is worn away, it would seem necessary that there should be a larger blood supply, and but natural that these numerous capillaries take the form of papillæ, being so constantly active; but I fail to see that this implies that the tissue of the stratum intermedium filling up the spaces between the papillæ should necessarily be glandular.

Dr. Williams continues, "Several observers of distinction, notably Dr. R. R. Andrews and Professor Spee, have described the development of enamel as a process in which the tissue is formed by the deposit of droplets or spherules of calcoglobulin. This view is undoubtedly correct, but, as stated by the authors mentioned, it does not include all of the phenomena that may be observed. The first important fact to be mentioned concerning the appearance of droplets or masses of "calcoglobulin" in the ameloblasts is that the

process is an intermittent one. Sometimes the cells on one side of a developing tooth will be full of these masses, while on the opposite side there are none to be seen." "The ultimate structure of completely formed enamel shows that it is built up by the deposit of bodies, which are of very nearly uniform size. There is, as we shall see, no uniformity in the size of these masses of "calcogobulin," neither is there anything in their structure which corresponds with that of formed enamel; in fact, under the finest lenses that are made they show as highly refractive masses without definite structure. Although they are usually more numerous at the inner ends of the ameloblasts, next to the forming enamel, they may be seen throughout the entire length of these cells, and I have often seen them lying close up to the membrane which separates the ameloblasts from the stratum intermedium. Occasionally I have espied them when they seemed to be actually in or emerging from this membrane. It is possible, and I think highly probable, that this substance ("calcoglobulin"), although appearing in the ameloblasts, is really formed in the secreting cells of the stratum intermedium."

If the stratum intermedium, which is an epithelial product, plays so important a part in the formation of the material that Dr. Williams takes to be calcoglobulin "for enamel matrix," why do we not find the same stratum intermedium in the dentine germ, where this so-called "calcoglobulin" is in the process of being constantly formed for dentine matrix?

The calco-spherites, which I believe to be the only matrix formers, are but partially formed in the protoplasmic fluids of these cells. Their origin is from the blood supply. This alone gives the lime-salts, which, passing through the fluids of the cells to the ameloblasts, become the calco-spherite, probably in the identical way as do the salts of lime in the presence of organic fluids as was seen in the brilliant experiments of Mr. Rainey, Dr. Ord and Professor Harting.

Dr. Williams forgets that calcoglobulin is a substance formed of these calco-spherites, and only formed at the point of union with calcified tissue, where a further calcifying process gives it a texture impossible to destroy with acids. Such a substance is not formed "in the secreting cells of the stratum intermedium."

It will be remembered that the contents of the ameloblasts were always spoken of as granular until I called attention to the fact that the contents were globular, not granular, as early as 1878, and as they pass down into the ameloblasts they are so minute as hardly to be seen with our best lenses. It is only when they are within the ameloblasts below the nucleus that they are easily seen as minute globules. At the ends of the cell nearest the enamel they take the shape they assume, probably by coalescing. They are somewhat larger than the rod they are to form, but seem to be drawn into the size of the enamel-rod by compression. My photo-micrographs illustrate this beautifully. The large masses of what Dr. Williams calls calcoglobulin seen in some of Dr. Williams' photographs are, I think, postmortem changes where many globules have coalesced, forming the large abnormal masses. I have seen them coalesce from pressure on the cover-glass while examining specimens. It is only when the globules are against the enamel and fixed by partial calcification that they show their real size. My investigation teaches me that it is probably impossible that there can be two sets of globules, each of a different nature, forming in the enamel-cells, as stated by Dr. Williams. His statement that almost every different method adopted is certain to produce a greater or less modification of conclusions I have found to be true, and it was only after working over hundreds of sections and finally finding a way to prepare the tissue very near the life of the animal that I came to the conclusions which I gave in my Chicago paper.

Speaking of the appearance of fibers in the young enamel he says, "The ameloblasts are raised from the developing enamel, and, projecting into the space thus formed, we see strings of the albumin-like material which sometimes extend quite across the clear part of the field. In several places these strings are seen to be drawn out from the transparent droplets. Whether these strings be drawn out from the interior of a calcifying enamel-rod, as described by Mr. Charles Tomes, Dr. Graf Spee and others, or are merely an extension of one of the transparent droplets, they are evidently always produced by the same material and substantially in the same manner, viz., by the drawing out or extension of an albumin-like product of the enamel organ." In this Dr. Williams loses sight of the fact, which I then clearly demonstrated, that there are fibers and many of them appearing like the fibers of connective tissue, passing from the cells of stratum intermedium through and among the ameloblasts. He further remarks, "But whether in the form of droplets or strings this substance is probably "calcoglobulin," an albumin-like material holding the calcific material, or at least some portion of it, in solution."

I think I have proven conclusively that these strings are not calcoglobulin. They have a fiber foundation. Allow me to quote from my paper: "Appearances of calcified fibers projecting beyond the line of calcification I had already seen in forming enamel, and I commenced a series of investigations to see if I could find out what these appearances indicated.

"I commenced by trying to tease apart enamel-cells; after some little experimenting I am quite sure I found evidence that processes from the cells of the stratum intermedium of the enamel-organ pass down through and among the ameloblasts to the forming enamel beneath. And I judge that these are the processes which Mr. Tomes saw and described as processes connecting the enamel-cells with the cells of the stratum intermedium. I then commenced a series of experiments, trying to separate slightly the layer of enamel-cells from the stratum intermedium. The parted edges had the appearance of broken processes, and in several specimens there are processes crossing from the enamel-cells to the stratum intermedium." And further, "Connecting with the fibrous net-work and running to the formed enamel beneath, we find innumerable thread-like processes, appearing like fibers. To sum up my conclusions: I am led to believe that there probably exists in developing enamel, as has already been found in developing bone and dentine, a fibrous sub-structure on and between which the enamel is deposited. After the enamel is wholly formed, its existence seems to be wholly blotted out in the dense calcification of the tissue."

Dr. Williams' strings of "calcoglobulin" are really these fibers coated with an albumin-like product.

This I think I have proven to my own satisfaction. When coated with this material, as they most always are, they look as if they were pulled out of a semi-solid substance. These matrix-forming globules laid against the enamel already formed, but not wholly calcified, are, by compression, drawn into the form of the future enamel-rod and there fully calcify, as do also the fibers which serve as their scaffolding, and the albumin product that becomes the inter-enamel-rod substance. This I believe to be the process of enamel calcification, stated in few words. The enamel-rods are, as Dr. Williams says, built up by the successive rhythmical orderly deposit of these bodies of uniform size. The larger, more transparent irregular masses which he describes and which I have often seen, are only an aggregation of these same orderly deposits of uniform size which have for some unknown reason become fused or coalesced into the irregular mass. They are, I believe, postmortem changes, and of this fact I feel assured, because I have seen so many evidences of it, not only in studying the enamel, but while studying dentine calcification, where the proof seems absolutely conclusive.

In his paper, Dr. Williams has added a substantial contribution to our knowledge in showing us for the first time, that the so-called stellate reticulum is simply an intercellular substance which is left after the removal of the cell contents. I had thought with Dr. Sudduth, that the cells of this tissue must be a modified form of those cells composing the middle layer of the oral epithelium, changed from the polygonal to the stellate form, yet I never understood how the change was brought about; but Dr. Williams explains it. He says the cells undergo some change which renders their contents more watery, and thus they are easily washed away in preparing the sections. He clearly shows the cell contents, in his recent photo-micrographs, filling in the spaces between the stellate tissue. They are perfectly nucleated cells lying in the so-called stellate reticulum, which is really the slightly modified cell wall. He says that certain methods of treatment of the oral epithelium will produce appearances closely resembling the usual illustrations of the reticulum of the enamel-organ. He shows that what has been called the nuclei of the stellate reticulum are simply the corners of other polygonal cells which have been cut across in making the section.

In closing, I would say that I fully realize the good work Dr. Williams is doing for his profession in writing this series of papers. I know something about the self-sacrifice that such investigation costs. By the use of the finest modern objectives, he has given to us photo-micrographs that are wonderfully clear in every detail—photographs that would show the reticulum of Heitzmann and Bödecker if it were there. After carefully studying sixty or more of these pictures, I see no reason to change my views expressed in my Chicago paper. I do realize their beauty, and know something of the skill required to perfect them. In these finer points in the development of the dental tissues, especially of the enamel, there must necessarily be a good deal of obscurity which future investigation will probably clear up. I shall try to do something toward this end, and shall always welcome the views of other workers. I feel assured the best results will be brought about by a comparison of ideas on the different points in question, and I stand ready to change my views when I am convinced that I am in error.

COLD BATHS; THEIR USE AND ABUSE.

Read before the Clinical Society of Washington.

BY JOHN D. THOMAS, M.D.
WASHINGTON, D.C.

I do not intend to go into elaborate detail as to the history of the ablutions of man from the time Adam and Eve in their pristine bathing costumes, plunged into the cooling waters of Eden to the present era, when their descendants are carrying the rage for everything antique to the point of fashioning their bathing costumes as nearly as possible after those of their good old father and mother.

Suffice it that the cold bath maintains its right to belong to the D.A.R. of therapeutics by tracing its ancestry back to the fountain head of medicine, Hippocrates. Musa, Galen, Paulus Ægineta, one of the Savonarolas, Van Helmont, Blair, Huxham, Floyer, Hoffman, the Hahns, Wright, Currie, Priessnitz, Fleury, Brand, Jurgensen, Winternitz, Baruch, thus runs the pedigree, long and distinguished enough to have it fare better in this generation; and certainly should procure a hearing for it from any collection of medical men.

One reason for my choosing this subject was the seeming lack of interest displayed (except in connection with typhoid fever) by the profession of this country in a question of so great weight in many dangerous diseases. My remarks will deal only with one phase of hydrotherapeutics, namely, the cold bath. For hydrotherapeutics in general is too broad and massive a subject to be discussed in one paper. And further I do not wish to be classed with the water curists; but the wheat can be separated from the chaff only by discussion, and I trust we will be repaid by the amount of wheat we garner at the end.

As the realm of the physician includes the *preservation* as well as the *restoration* of health, a fact too often lost sight of not only by the laity but also by the profession, I wish to embrace in this discussion the use of the cold bath as a conservator of health as well as a therapeutic agent in disease; and also the abuses of the bath.

In order to recognize pathologic conditions in the human economy, it is of paramount importance to first become acquainted with the normal. So in therapeutics, it is necessary to first know the effect upon the healthy body of the agent you desire to use in disease. I have never forgotten the principle drilled into me at college by that great teacher, the late Dr. Wm. B. Towles, of the University of Virginia: "Never prescribe empirically if you can help it. Study and know the physiologic action of your agent, and you put yourself upon a scientific basis from which you can not be routed." But how soon do most of us depart from this good maxim, as from many others learned at the feet of such Gamaliels, especially when we get into the swing of dispensary practice. So the more thoroughly to comprehend the effects of the cold bath, let us study its physiologic action, through the skin upon the system.

Histologically the skin consists of epidermis, cutis vera, subcutaneous fatty tissue, sweat glands, blood vessels, and nerve terminals. The blood vessels ramify in the papillæ and in the subcutaneous tissue around the sweat glands and hair follicles. The nerves terminate in fine fibrils between the cells of the epidermis. *Physiologically* the skin is a mechanical protection to the internal organs of the body; it is an eliminative

organ; it is the great regulator of the body temperature, the principal channel of the loss of heat in man, the other great factor being the lungs. The subcutaneous fatty tissue acts as a non-conductor of heat, thus helping to retain the body temperature at normal. The body temperature is regulated through reflex action, by vaso-motor control, control of heat production, of respiration, circulation and of sweat glands. The skin is the telegraph instrument which sends messages of warning and command to all the centers of the complex nervous mechanism of the system. Such is the normal function of the skin. And it is only one step further to know the action of cold water upon the system, when applied to the surface of the body.

It has been discovered by Blix and Goldscheider that there are in the skin special nerve terminals for heat, cold and pressure. And that those for cold act with lightening-like rapidity, while those for heat act more slowly. When cold water is first applied to the skin there is momentary contraction of all the capillaries by reason of the stimulation of the vaso-motor constrictor nerves. But this is followed by a dilatation, according to the physiologic law that muscle recovers from stimuli as slowly as it acts. According to Baruch, "the sphygmograph demonstrates the fact that the dilatation of the peripheral vessels which ensues upon reaction is not accompanied by a loss of tone and is not passive, but is probably due to an excitation of the inhibitory nerves." The opposite effect is shown when hot vapor baths are given. It is a demonstrated fact that cold raises, while heat lowers the tone of the vessel walls. But if there is a *continuous* application of cold to the surface the vessels contract again permanently, having no reactionary dilatation.

The impression of the cold water upon the thermic terminals in the skin is carried direct to the centers in the brain and cord, and reflexes are sent to the heart, to increase the rapidity and force of its beats, and to the respiratory center to deepen, accelerate and strengthen the inspirations, demonstrated by throwing cold water in the face of a fainting person; and also by the sudden plunge into the cold bath, the effort to inspire being so pronounced as to abort, because the muscles can not respond quickly enough. The respirations then become regular and deep; and this deepening and strengthening of the respirations counteracts upon the circulation, helping and strengthening it, demonstrating very prettily the interdependence and community of action of the physiologic functions of the system. This general stimulation to the nervous system has the effect of a tonic upon it, and the whole economy feels the benefit—the secretory, excretory, circulatory, respiratory, motor, reproductive—all.

There is an increase in the *amount* of urine eliminated, but of lower specific gravity. The circulatory changes and temporary checking of perspiration are no doubt accountable for the increased amount, and other things being equal, increased volume means decrease in specific gravity.

A very important effect of the cold bath upon the system—the reduction of temperature—is considered by a great many physicians, especially in this country, the *only one*. This fallacy should be eradicated. The real benefits to be derived from the cold bath rightly applied have been so lost sight of, and in fact so little known by the profession at large, that when the looked for great reduction in temperature was not forthcoming in a case in which they used the much vaunted cold bath, but used it ignorantly and unscientifically, they have cried "anathema, maranatha" upon all hydrotherapeutics.

The pivotal point of all good effects to be got from a reduction of temperature by the cold bath is that there *must be* a good cutaneous circulation during the bath. The skin itself being a bad conductor could not eliminate much of the body heat by simple contact with the cold water. And the action of the continuous cold upon the surface would contract all the vessels and force the blood into the internal organs, thus causing a rise instead of a fall of temperature. Fleury of France has shown that a person dipped into a bath of 48 to 52 degrees F. for thirty minutes reduced the surface temperature; but the internal temperature not in the least. Thus the object is to overcome the contraction of the arterioles of the skin caused by the continuous cold necessary in a bath of from ten to thirty minutes. Brand of Stettin has found the remedy in simple mechanical friction of the surface either with the hand or a rough cloth. The constriction of the vascular walls is inhibited; the tone of the walls not being lost as in the hot bath, and the accelerated heart action sends the warm blood to the surface where it is cooled and returns to the internal organs, while more warm blood takes its place, and thus a continual interchange going on soon cools the whole body.

Upon tissue metamorphosis also is the beneficial effect of the cold bath shown, especially in phthisical patients. The increased circulation increases the functional activity of all organs and hence the tissue changes. "And Liebermeister has proven that oxidation is increased by the external application of cold shown by the execretion of carbonic acid so long as the body temperature is not much disturbed." (Baruch). So much for the physiologic action. If we understand that thoroughly, the mastery of the technique will be easy, for we will know the reasons for every move—not be working empirically.

Great stress is laid upon the exactness of the technique by those who are authorities upon hydrotherapeutics; but if they would spend the same amount of energy and exhortation upon impressing the importance of a thorough knowledge of the physiologic action of the agent to be used, the different steps in the technique would be so thoroughly appreciated that any omission or error would at once be perceptible.

The cold morning bath in health is a good thing if properly and judiciously performed, and *not abused*. For those beginning its use it is well to first stand in about eight or ten inches of warm water and sponge off with water gradually cooled until they can with comfort take a plunge bath at 80 or 75 degrees F. for the first two or three days; the temperature of this being gradually lowered to 60 or 50 degrees F., which is easily borne, producing a healthy reaction and glow. It accelerates the blood flow; raises blood pressure, thus flushing the eliminative organs after their night's work, and starting them on their day's duties fresh and invigorated. Just as we exercise the voluntary muscles and nerves by gymnastics, so are the involuntary muscles of the cutaneous vascular system exercised by the gymnastics of contraction and dilatation. The great temperature regulator of the body is kept in order. It stimulates the nerve terminals and gives tone to the whole nervous mechanism. By keeping the normal functions of the

skin at par it aids and relieves the other eliminative organs of the body. Thus as an aid in the preservation of health it has a distinct and useful place in our armamentarium.

A form of bath which appears to have many advantages as a therapeutic agent, but which I have never seen used, is the half bath. The technique is briefly as follows: eight or ten inches of water at a moderately warm temperature in the tub; patient sits in the water with cold towel around the head; patient and attendant rub the body well while attendant pours and dashes the cold water over the head, shoulders and back. This is continued from ten to thirty minutes, friction being kept up all the time. A most excellent thing in this bath for some conditions, especially respiratory affections, is the affect gained by dashing the cold water on the body. The after-treatment is the same as in the full bath which is given below.

The full bath is typified in the Brand bath. I will run over rapidly the main points as described by Baruch in Hare's System of Therapeutics: Patient is prepared by giving a stimulant just before being put into the bath (one-half to two ounces of brandy). Preparations are screened from patient because of psychic disturbance. Tub is rolled up to the side or end of bed, and patient after having face and chest bathed with ice-water (I have found serviceable a towel soaked in cold water applied to the head) is lowered into the water which is at the required temperature, according to the condition of patient. The whole body, up to the chin, is immersed in the bath, and immediately the attendant or attendants, two are preferable, begin applying *gentle friction* to the surface of body with the open hand. Patient will complain that he is freezing and can not breathe, but reassure him and keep him in the bath for at least fifteen minutes, continuing friction all the time. The best guide to the safety of the bath is the condition of patient. Cyanosis of lips or face is a signal that circulation is failing and we must remove the patient at once. Another sign of collapse is a thready and rapid pulse. After remaining in bath about fifteen minutes, lift the patient up gently, letting the water drip off for a minute, and lay him over on a linen sheet spread over a blanket. The sheet is wrapped around him, being tucked between arms and chest and between limbs. If temperature had been high, above 103 degrees, the blanket is also wrapped snugly around him, and he is left with hot bottles at his feet to sleep, but if temperature was below 103 degrees when he was put into bath, he is rubbed dry with the sheet and towels and put to bed. [At this stage I have always found it a good plan to give a little stimulant (one-half to one ounce of whisky). Osler recommends the same in his "Practice."]

The bath which is most used I think, especially in private cases, and which I found gave splendid results, was the so-called "graduated full bath." It is simply a cooling of the water gradually after the patient is in the full bath, by adding either cold water or ice. The same methods are followed out as in the Brand bath, except that the length of time in the bath is increased to double. The patient does not undergo the intense shock of being suddenly plunged into ice-cold water.

The therapeutics of the cold bath may be summed up as follows; 1, as antipyretic; 2, as a general nervous and muscular sedative and tonic. Osler thus sums up the good effects in typhoid fever; 1, the reduction of fever; 2, clearing the intellect, lessening stupor and disappearance of muscular twitchings; 3, general tonic action on nervous system, especially the heart; 4, insomnia lessened; 5, most important of all the mortality is reduced to a minimum. Hare in the Boylston Prize Essay on "Fever; its Pathology and Treatment," says: "Cold bathing is a power for good before which every other measure must stand aside."

The idea is quite prevalent in this country among the laity, and indeed to a deplorable extent among the profession, that the use of the cold bath is restricted, if used at all, to typhoid fever. I wish to draw your attention more particularly to its use in other diseases than typhoid. The brilliant results achieved in this disease can be found by referring to almost any recent work on the "Practice of Medicine." And the erstwhile unknown and unsung Brand of Stettin has floated, and justly so, into the realm of fame in his tub, as did Diogenes of old.

Its use in the exanthemata is sometimes of great advantage. In *typhus* it was used by Currie in an outbreak in Liverpool in 1792. He used cold sea water a 60 degrees F., and poured it "over the naked bodies of those whose strength was not greatly reduced, and whose heat was steadily above the temperature in health." He had great success with this disease. Jurgensen recommends it in his work "Pathologie und Therapie." Osler says it "should be thoroughly and systematically employed as in typhoid. Strümpell says, "besides good nursing a judicious employment of baths is certainly our chief reliance for lessening the severity of many of the symptoms, such as febrile, nervous and pulmonary disturbances, as well as for averting many dangerous complications." Manuel Dominguez, Professor of Therapeutics in Medical School of City of Mexico, writing in Hare's System of Therapeutics, speaks in the highest terms of the use of cold baths in this disease; but personally prefers to use the tepid bath.

Scarlet fever.—Again let me quote that great pioneer in hydrotherapeutics, Currie, in his experience with this terrible disease in his two boys, showing his perfect confidence in the efficacy of the cold bath to do all that could be done. "I shut myself up with these boys, and with plenty of pump water and a pocket thermometer prepared, not without anxiety, to combat this formidable disease. As soon as the sensation (of heat) was steady in my eldest boy, I stripped him and poured four gallons of water over him of the temperature of 64 degrees. The usual good effects immediately appeared, but at the end of two hours he was as hot as ever; the remedy once again applied, and repeated as the return of heat indicated. By the time the eldest was ready for his third affusion, the youngest was ready for his first. The heat rose in the eldest to 109 degrees, in the youngest to 108 degrees, and the pulse in each was upward of 150. In thirty-two hours the first had the affusion fourteen times; eight times cold, twice cool, and four times tepid; twelve affusions sufficed in the case of the youngest, of which seven were cold. The fever in both was completely subdued. On the morning of the third day they were both evidently safe." He also reports 150 cases treated by the cold bath.

Osler says on this disease, "In cases of high and and rapidly increasing fever the graduated bath

should be used." Strümpell says the same thing. Dr. Hiram Corson of Pennsylvania says, "rarely has any one made a more careful trial of any remedy than I have made of this, in a practice of fifty-nine years, under the daily watch of intelligent physicians, anxious no doubt for my success, but doubtful of the propriety of my practice, and too timid to resort to measures to them so heroic. And now in closing my career as a practitioner, and looking back on the countless fights I had with death in hovel and in palace, I can truthfully declare that no means ever used by me, or which have ever been known to me as used by others, in scarlet fever, have so successfully warded off its blows and shielded patients from harm and restored them to health as the use of cold water and ice." Dr. Alexander Goldstein[1] reports from the Buda Pesth epidemic of 1891, 231 cases of scarlatina in which cold baths were chiefly used. When they needed an antipyretic the baths were used in preference to all others, and his testimony is, they "acted excellently." The good effect was not only in lowering the temperature, but also in improving respiration, innervation and cutaneous action. They used a form of the graduated bath, pieces of ice moved back and forward in the water causing waves of cold to impinge upon the body. Dr. Reimer, who treated over 3,000 cases of scarlatina by various methods, has the following to say about cold baths: "The efficiency of full cold baths was undoubted in scarlet fever, if they were used methodically and with proper precautions. The patient is plunged into a tub half filled with water at a temperature of from 57 to 54 degrees F. After removing him from the water, he must be rubbed briskly and wrapped in a woolen blanket. The temperature frequently drops several degrees; patients are much relieved and desire a repetition. In scarlatina the indications for hydrotherapy vary with the progress of the disease." His experience with the gradually cooled bath is that it is pernicious in this disease. Ziemssen also adds his testimony to the good effects of the cold bath in scarlet fever, putting it before antipyretic drugs.

In *smallpox* the use of the cold bath is limited. Currie and others used it to some extent. Strümpell recommends it in the initial stages to reduce fever. Osler says the cold bath at 70 degrees F., repeated every three hours in cases of pyrexia combined with delirium and subsultus is much preferable to the medical antipyretics. But the general concensus of opinion does not recommend it as a routine practice, the warm or tepid bath being preferable in the eruptive stage.

The other exanthemata rarely demand the use of the cold bath, but if the fever rises very high, there is no better remedy than the cold bath to equalize it.

Rheumatic fever. For the very high fever sometimes encountered in this disease we have a most valuable remedy in the cold bath; and in fact the only agent which has proved of any use in combating the extreme hyperpyrexia. The results obtained, the reduction of temperatures which had reached the flood-tide mark of 110 F. are certainly remarkable, and stand as an incontrovertible argument for the efficacy of the cold bath as an antipyretic.

Neither Strümpell nor Osler in their text-books on practice have much to say upon the treatment of hyperpyrexia in rheumatism, but both recommend the cold bath or cold pack as the best agents to use. Stewart of McGill University, Montreal, says: "When hyperpyrexia has set in, it is useless to employ drugs of any kind to reduce it. It is only wasting valuable time, the only measure of real value is cold, and it is clear from the general experience on this point that the sooner it is employed the better are the patient's prospects for recovery. The general cold bath is certainly the most effectual way of carrying out the antipyretic action of cold; in some cases a single bath is all that is necessary." In others as many as twenty-six have been given. Wilson Fox collected a series of twenty-two cases from 1867 to 1871; temperature from 106 to 111.7 degrees; eighteen were treated by ordinary means, without cold, and all died. The other four were treated by the cold bath, three recovered, highest temperature being 110 degrees. Dr. Male collected in the ten years ending 1890 sixteen cases; temperature from 106 to 110.4 degrees. The pack was used in eight, with two deaths; and the bath in the other eight with one death. Baruch reported a case, temperature 106 degrees; cold bath given and ice applied to joints; recovery. Medley, Murchison, Ringer, Charcot and others have reported cases with temperature reduction of from 5 to 8 degrees. The Committee of the Clinical Society of London made the following report on sixty-seven cases from the ten years ending 1879. Synopsis given by White in his "Text-book of General Therapeutics." "Of the cases that were not bathed only one in which the maximum temperature exceeded 106 degrees recovered; of the cases that were bathed, fifteen (or five-eighths of the total) in which the maximum exceeded 106 degrees recovered. Again six out of eleven fatal cases which were not bathed, the maximum was under 106 degrees but in only three out of the twenty-two fatal bathed cases was it so low. Often the treatment is of no avail; but on the other hand it frequently turns the scale toward recovery, when the temperature has not reached an extreme height. In a considerable number of deaths, recourse to bathing has been too tardy to be effectual. The treatment must be begun without any delay whatever, directly hyperpyrexia, however slight, is detected, and must be perservered in unremittingly so long as the temperature remains high. The committee truly says that a strict watch must be kept for the prodromal signs; two, which are most noteworthy, are delirium and a cessation of the articular pain. Cold bathing not only reduces the temperature, but also allays the delirium, brings down the frequency and increases the strength of the pulse and promotes sleep even in the most desperate cases. If it were made a rule to put the patient in a cold bath whenever the temperature reaches 105, the mortality in rheumatic hyperpyrexia would greatly fall." But great care must be taken in these cases for they are all in a very precarious condition when they reach the point of needing the bath. And the true rationale of the cold bath as an antipyretic must be borne in mind—do not literally swamp the internal organs with the hot blood by driving it all away from the surface. Especially watch the weakened heart in the cases that are treated late.

Insolation.—In this condition where high fever exists the cold bath is the only efficient remedy to combat it. In this as in rheumatic fever extreme temperatures are often successfully reduced, the patient being brought from a state of gravest collapse to a condition of comparative safety. I have seen

[1] Baruch: Uses of Water in Modern Medicine.

cases brought in unconscious with temperature from 107 to 109 degrees F., recover with bath treatment.

Anemia.—In 1878 M. Thermes demonstrated with Hayem's hemometer that the judicious application of cold to the periphery increased the number and improved the quality of the red blood corpuscles. And Winternitz has demonstrated an improvement in the oxyhemoglobin constituents, by Fleischel's hemometer. And to these Baruch adds his testimony of numerous cases of anemia and chlorosis yielding to hydriatic measures after iron treatment had proved futile. Professor Shattuck of Harvard University (in Hare's Syst. Ther.) also recommends for this disease, after vigorous frictions of the body in the mornings, the cold affusions while seated in a few inches of warm water.

Phthisis.—Winternitz says in a recent article in the *Deutsche Medicin. Wochenschrift* that cold water is the best means to fortify the system against phthisis by reason of the general tonic influence on the system. And further in cases already advanced the cold water decreases the fever, increases the body weight, decreases the night sweats, lightens and diminishes the cough and expectoration, and other subjective complaints; there is an improvement of the local conditions, lessening and disappearance of the bacilli; and these statements he has proven by clinical work.

Pneumonia.—Before the Tenth International Medical Congress in Berlin, Dr. A. H. Smith read a paper in which he showed the true rationale of heart failure, which is the fatal element in pneumonia, to be the overwork of the right heart in trying to force blood into the consolidated lung tissue. And as a remedy for this he proposed to dilate the blood vessels of the remainder of the body so they could hold some of the blood that was flooding the right heart. To accomplish this he advocates medicinal remedies. But have we not most efficient and rational aid to the fulfilment of the indications in the cold bath? Medicinal agents can not maintain for any length of time the dilatation of the cutaneous vascular system unless the tone of the vessel walls is assured. The cold bath while rendering this necessary aid, at the same time gives tone to the whole nervous system, strengthens the respirations, stimulates the heart, quiets delirium, reduces the temperature, and gives the patient a much needed rest and sleep. All this I have seen accomplished by the cold bath. And while my personal experience has been limited to one case, that one was so markedly benefited by it that a lasting impression was made upon me. The case came into Gouverneur Hospital, New York, one morning with a temperature of 100 degrees F., and fine râles in one lung. By evening the temperature had risen to 106 degrees F., pulse 130, respiration 45, rapid consolidation going on in lung, and patient getting delirious. There was a typhoid patient in the same ward being bathed every three or four hours, and everything being convenient and patient almost *in extremis*, I had him given a plunge both at 79 degrees F. which was gradually reduced with ice to 40 degrees. It lasted about ten minutes. This bath did not reduce the temperature very much, but the general effect upon the patient was good. Delirium disappeared. The following morning, temperature still being quite high, another bath was given at from 72 to 44 degrees F., and from that time the temperature continued to fall until it reached normal on the fourth day of the disease. The patient had a rise of temperature on the ninth day, but nothing in the lungs to account for it. It went up to 102.6 degrees suddenly on the evening of the twelfth day, and as suddenly down again below normal the next morning. For six days these remissions occurred when temperature went to normal aud stayed there, patient soon afterward recovering perfectly. I saw patient some weeks later and found lungs normal and healthy.

The percentage of mortality has been, and still is so high in pneumonia, that any means of lowering it should be received with favor by the profession, and especially when this means is based upon a rational physiologic foundation, proven by thousands of trials sanctioned and conducted by the best clinicians of the day. And yet so great is the timidity, or shall I say conservatism, of the profession at large, that I doubt if one practitioner in a thousand could be found to give the cold bath a trial in his private practice; or even the cold pack, for which neither the patient nor doctor seem to have the same horror.

Since the old adage that "figures can't lie" has been reconstructed to read "nothing is such a convincing liar as figures," I will not attempt to give you the record of thousands of cases from some of the best men of this and other countries, but will content myself with presenting to you some of the opinions of these men, formed from large experiences.

Strümpell recommends the cold baths in severe cases, not for the pyrexia simply, but for their effect upon the respiration and nervous system. Jurgensen advocates the very cold baths, preceded by stimulants, and he confirms his recommendations with wonderful results obtained. Penzoldt says after treating 2,200 cases: "If the indication is, beside reducing temperature to improve the circulation, respiration and cerebral activity, and further expectoration, preference should always be given to a cautious bath treatment." Fismer reduced the mortality almost half in 230 cases treated by baths as against the same number treated without. Vogl (Baruch, "Uses of Water in Modern Medicine"), chief of Munich Military Hospital, has found the bath, as in typhoid, of great value in pneumonia. Dr. Boardman Reed of England, says in a paper on pneumonia "that water locally applied either by wet pack or in the form of baths, after the Brand method, is the most efficient single remedy or therapeutic measure for acute pneumonia." In our country we find Osler recommends it in very high fever. Pepper says of pneumonia in children that when high fever is present recourse may be had to strong antipyretics "but hydrotherapic measures are more efficient." He recommends cool and cold sponging, cold pack and baths. Graham of Jefferson Medical College says that pyrexia often reaches a dangerous height in pneumonia, and "undoubtedly the safest and most reliable means of reducing this pyrexia or hyperpyrexia is by the external application of cold." "The cold bath has," he says further, "notwithstanding its advocacy by many prominent American physicians, and the lessened mortality following its use, never become popular in this country." This he attributes to the necessity of portable tubs and attendants. And finally Simon Baruch says: "We have every indication in the treatment of pneumonia fully met by the properly adopted bath, namely, 1, to reduce the temperature; 2, to tone up the action of the heart; 3, to refresh the failing nerve supply of the heart and lungs; 4, to deepen the respiration; 5, to enlarge the surface of the blood; 6, to restore the lost tone of the capillaries." I can

not agree with Baruch in his sweeping statement that "every indication is fully met by the bath." But this point I wish to emphasize, if used judiciously in conjunction with other remedies its value is of unmeasured worth.

Abuses and contra-indications.—It is certainly a fact that one disastrous case from cold bathing will do and indeed has done, more toward creating a feeling of antagonism to the method than 1,000 cases of undoubted success will do toward forwarding it; and that, in spite of the fact that it was done ignorantly, or in direct disregard of all physiologic laws. Baruch mentions a case in point. A young hospital physician and teacher expressed abhorence of the cold bath treatment of typhoid; and when asked why, he said he had seen a nurse killed by it, and this is the description of their method as given by him: "We endeavored to reduce her temperature by wrapping her in a sheet, placing her on a Kilbs cot, and sprinkling her with ice water." Do you wonder that it proved to be her winding sheet? And Baruch gives another instance of the same method being used in one of the hospitals of a large city. Another way in which the cold bath is brought into ill repute is by not exercising the proper amount of care in selecting the cases for baths. Patients with atheromatous vessels, with organic heart disease, with hearts which are already on the verge of disolution from some exhausting disease, should never be put in the cold bath. Indeed, I am of opinion that there are some nervous organisms which can not stand the cold plunge even in health. lacking the one desideratum, namely, the ability to react quickly and completely. While mentioning the abuses of the cold bath in therapeutics, it will not be out of place to give a very striking instance of the extent to which their fervor will carry some in using it as a hygienic measure. I was told by a young man who had been in the habit of taking a cold bath every morning, that he was in the country and arising early and having no means handy for taking his accustomed cold bath, he went down to the river. and breaking a hole in the ice, jumped in. He was fortunate to escape serious results; but it demonstrates the folly of carrying any measure to extremes. The one cardinal point always to be borne in mind in health and disease is *to get reaction.*

And now in closing let me emphasize the point, that although the cold bath is a great aid in the battle against disease, it is not a specific for the germ disease, nor in fact for any disease. It is only one of the agents to combat the symptoms, but *a powerful one.* And if used rationally, understandingly, conscientiously, I think you will agree with me in giving it its rightful place among the foremost therapeutic agents of the day.

The Cairo Flats.

THE URINE IN DIABETES MELLITUS.

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While diabetes mellitus is not a disease of the kidney, it finds its chief clinical expression in certain profound alterations in the character of the urine. This fact renders the study of that secretion of primary importance in the diagnosis and management of the disease. The great practical value of urinary analysis in these cases is generally recognized, but the importance of painstaking and frequently repeated examinations is not so extensively appreciated. An analysis which includes only the detection of sugar and the estimation of the specific gravity and reaction is rudimentary and neglects many valuable considerations. Close observation of the urine will help us to a more perfect understanding of the progress of the case and its prognosis, and will result in the early detection of developing complications.

I have been impressed by the comparatively casual manner with which the urinary changes of this affection are considered in special and general text-books, and the following detailed description of the urine in this interesting condition is inspired thereby. In no disease are the urinary changes more profound. Hardly a single character, physical or chemic, escapes some alteration. Most marked are those affecting the physical characters of the urine. Usually the first symptom to attract the attention of the patient is the polyuria. Impressionable and nervous patients become immediately much alarmed on this account. The quantity of urine in nearly every case of true diabetes mellitus is greatly increased, the average range being from eight to fifteen pints daily. It has been known to exceed thirty-two pints, and Bence Jones reported a case in which the daily excretion reached seven gallons. The quantity, while constantly increased, varies greatly from day to day and at different times of the day. It bears a pretty constant relation to the excretion of sugar, the polyuria diminishing with improvement in the glycosuria and consequent diminution of thirst. No more water is excreted by the kidneys than is ingested, as was formerly alleged. Polyuria is one of the most constant urinary signs of diabetes, and if a high specific gravity be associated with it, is of considerable diagnostic importance. In rare instances the disease is not attended by polyuria. Frank has named this exceptional form "diabetes decipiens." Such cases are generally considered less serious than those in which the urine is abundant. The color of diabetic urine depends much upon the degree of dilution. Typical diabetic urine is a pale amber, but when not attended by marked polyuria it may be of dark color. When heavily charged with sugar it may have a greenish hue. The quantity of urine secreted during the night is as a rule less than during the day, contrary to the general rule in pathologically induced diuresis. Diabetes is often ushered in by a pre-glycosuric diuresis lasting for a considerable time. Likewise a post-glycosuric polyuria attends convalescence when a cure of the disease takes place. This latter is probably accounted for by the polydipsia which persists for a considerable period after the sugar has disappeared from the urine.

The urine in this affection constitutes a marked exception to the general rule that increase in quantity is attended by a diminution of specific gravity, for notwithstanding its large volume, the density is high. This is due to the presence of sugar and to the augmented excretion of urinary solids. The specific gravity has been noted as high as 1070, although the average range is between 1028 and 1045. It is not invariably increased, however. Saunby, Flint, Cameron and others have reported cases of undoubted diabetes mellitus attended with low specific gravity. Such cases are rare, and when met with should be regarded with suspicion, appeal being made to the phenylhydrazin or fermentation tests to prevent error, as faulty reduction of the cupric oxid tests by non-

saccharine reducing substances may have taken place. In addition the urine should be submitted to careful microscopic examination for casts and be tested for albumin, as an incipient interstitial nephritis may coexist.

Urine heavily charged with sugar may have a diminished consistence. When shaken such urine forms an abundant froth. This does not subside as quickly as does that of normal urine, but is less creamy and permanent than the froth of highly albuminous urine.

The transparency is not usually altered. Indeed, in this condition the urine is notably clear and free from sediment, as a rule. Occasionally, however, and most frequently is this the case in gouty subjects, the urates may be precipitated. Upon standing, the urine may assume a bright and opalescent hue, and if exposed to warm air for a time, a white flour-like deposit of yeast fungus forms in the bottom of the vessel. If indican be present in excess, as it frequently is in this condition, the urine becomes red upon standing, from oxidation of that product. Blood has been noted as a deposit in advanced cases.

The odor of diabetic urine frequently resembles that of hay, but in advanced cases may possess the peculiar chloroformic order of acetone. This often precedes the development of diabetic coma and when present should excite apprehension. The urine has a distinctly sweet taste from the presence of sugar. In certain rare cases air is voided with the urine. This pneumaturia arises from a formation of gases in the bladder consequent upon fermentation changes in the urine.

The chemic reaction is invariably acid unless complications exist, and, as a rule, more sharply so than in health. This acidity persists apparently undiminished during the "alkalin tide" after meals, and is not affected to any degree by the administration of alkalin remedies. Upon standing the urine becomes more acid, alkalin fermentation being long delayed. On the other hand, alcoholic fermentation quickly supervenes, the specific gravity at the same time being lowered from the conversion of sugar into alcohol. Derignac has pointed out that the acidity is increased with the acetonemia of diabetic coma. The total daily excretion of urinary solids is increased.

A brief glance at the condition of the normal urinary constituents will develop some important and significant facts. The elimination of urea is almost invariably increased, and this is the case throughout the disease. Occasionally we notice a fall in the excretion of urea without assignable cause, and such an event frequently presages diabetic coma. The increase of urea is brought about by a variety of causes. They are briefly, 1, largely increased ingestion of nitrogenous food rendered necessary by the anti-diabetic dietary; 2, increased tissue metamorphosis; 3, great functional activity of the liver; 4, to some extent to the washing out of the tissues by the diuresis. This increase in urea bears a direct relation to the severity of the disease.

Other urinary solids are also affected, although to a less extent. The excretion of uric acid is slightly increased as a rule, although it is seldom seen as a deposit. The reason for this is that the largely diluted urine exercises an increased solvent power in proportion to its dilution, and keeps the uric acid in solution when it would otherwise appear as a deposit. Occasionally, in gouty subjects, a precipitate of urates is observed. Frequently an improvement in the patient's condition and a diminution of the polyuria is attended by a deposition of urates and uric acid crystals.

The inorganic constituents of the urine, the chlorids, phosphates and sulphates, are as a rule somewhat augmented. This is partly due to the diet and partly to the washing out of the tissues. It is well to bear in mind that this increase in the urinary solids is not a relative one, but an absolute increase. The large dilution of the urine may result in their proportionate diminution, while in the aggregate they are increased.

Indican is found in excess in diabetic urine, and when exposed to the air such urine becomes deeply red. The increase is greatest just before and during coma, probably the result of the constipation and intestinal fermentation accompanying that condition.

According to Stadelmann, Von Norden, Wolpe and others, ammonia is frequently present in large amount, but is neutralized by the beta-oxybutyric acid present and the urine remains acid. An increase in hippuric acid and creatinin has also been noted.

While the foregoing facts are important clinically, it is upon the presence of sugar in the urine that the diagnosis rests. The mere presence of sugar or copper-reducing substance will not suffice for a diagnosis of diabetes mellitus. It is necessary to establish beyond doubt its presence as a constant product in the urine, and also the fact of its excretion in some considerable quantity in order to distinguish from other and less serious forms of glycosuria. The average range of sugar excreted is over 4 per cent. not uncommonly rising to 7 or 8, or even 12 per cent. The total daily excretion may be but a few drams or may reach a pound or more. It fluctuates greatly from day to day, varying with the diet and physical condition. An intercurrent attack of fever or some grave disturbance of the general system will sometimes result in a diminution or total disappearance of the sugar for a time. It is also diminished before and during diabetic coma. Starchy foods, mental worry, over-exertion, biliousness, are among the causes which increase the glycosuria.

The tests most commonly used for the detection of sugar in the urine are the cupric oxid tests, and of these Fehling's method has been for years the one most generally employed. In common with the others of this class, it depends for its reaction upon the power which glucose possesses of reducing cupric oxid to lower forms of oxidation with the formation of a yellowish or red precipitate soluble in ammonia. For the detection of large quantities of sugar in the urine, Fehling's test is a reliable method. When, however, but a small quantity is present, its results can not be depended upon. In its application we are directed to add the urine to the boiling test drop by drop until reduction takes place or until as much urine has been added as we have test solution. The quantity of solution employed is usually one dram.

There are certain non-saccharin substances present in the urine which reduce cupric test solutions, and they constitute a fertile source of error when but slight reduction takes place. Of these substances the most misleading, because present in normal urine, are uric acid and kreatinin. With Fehling's solution concentrated normal urine will almost invariably produce a reaction closely resembling that due to small quantities of sugar. This pseudo-reduction is owing to the presence of these two substances in excess, their proportions being raised by the concentration of the

urine. The large quantity of urine used in the application of Fehling's test renders it very susceptible to this error. If a smaller quantity be used its delicacy is impaired. It is with urines of high specific gravity and increased acidity that we exercise the greatest care in testing for sugar. A high specific gravity does not by any means always indicate the presence of sugar, for very frequently we see concentrated urine with a density of 1025 to 1032 which contains no sugar. Such urine produces false reduction of Fehling's test solution, consequently in cases where discrimination is essential this method is most unreliable and misleading. Glycuronic acid is another possible cause of error. It is present in excess in the urine after the ingestion of camphor, chloral and chloroform, and gives rise to a reduction of the copper tests closely resembling that produced by glucose. The smaller the quantity of urine that is used in testing the less likely is this mistake to occur. In addition to these sources of error in using Fehling's test, its instability, the influence which the presence of albumin has in interfering with the reduction, and its well-known tendency under certain circumstances to undergo spontaneous reduction, are other objections to its use.

It is important to be able to recognize minute traces of sugar in the urine, for while such may give rise to no appreciable symptoms, they are indicative of a tendency which may at any time, unless corrected, develop into diabetes mellitus. This can not be accomplished with certainty by Fehling's method for reasons already recited. In striving to accomplish this end and at the same time overcome the disadvantages of the methods in common use, I have evolved the following method,[1] which has thus far in my hands given most satisfactory results. It is delicate, recognizing with certainty as small an amount of sugar as .1 per cent., while requiring the employment of but a very small quantity (8 drops) of urine, thus possessing the two great essentials of a perfect test for sugar. In addition it is simple, easily applied and accurate, and its reaction, even with the smaller quantities of sugar, is easily distinguishable. It is prepared and applied as follows. Solution No. 1:

Cupric sulphate C. P.	grs.	xxvij.	1·60
Glycerin pure.		ʒiij.	12
Distilled water		ʒiiss.	10
Liquor potassæ	ad	ʒiv.	128

Dissolve the copper sulphate in the glycerin and water. Gentle heat will facilitate its solution. When cold add the liquor potassæ, mix thoroughly and filter.

Solution No. 2 is a saturated solution of chemically pure tartaric acid in distilled water.

These solutions, when carefully prepared, are quite stable and with ordinary care will keep unimpaired for months.

Into a test tube pour one dram of the cupric oxid solution (No. 1) and gently boil over a spirit flame. Then add two or three drops—never more—of the tartaric acid solution and boil again. The solution remains perfectly clear and transparent and is of a beautiful blue color. Now add the suspected urine drop by drop, boiling and shaking the test between each drop until reduction takes place or until eight drops of urine have been added. If no reduction follows the addition of this amount of urine, sugar is not present. The end reaction is a yellowish-red deposit of cuprous oxid which is marked and unmistakable. The reaction deepens when allowed to stand for a few moments.

Applied in this manner this test will detect one part in 1,000 of urine, or less than one-half grain to the ounce. If the percentage of sugar be large, a single drop of urine will promptly develop the reaction. The addition of three drops gives a marked reduction with two grains, and four drops will detect one grain to the ounce of urine. In applying the test care must be taken not to use a larger quantity of the tartaric acid solution than three drops to the dram of copper solution. If more than this be used the character of the reaction is affected, a discoloration rather than a precipitate being produced, and the delicacy of the test is also somewhat impaired. A greater quantity of urine than eight drops should not be used. By so doing greater delicacy may be obtained, but reliability will be sacrificed for increased sensitiveness, and the special value of the method destroyed. The presence of albumin in the urine does not act as a deterrent to this reaction.

Glycuronic acid, when present, gives rise to considerable confusion in testing for sugar. It is found in normal urine in such small quantity as to be considered practically absent, but after the administration of certain drugs it may appear in considerable amount, in which event it throws down a heavy precipitate with copper test solutions, indistinguishable from the reduction produced by grape sugar. This condition was erroneously considered a form of glycosuria by the older observers. If its presence misleads, certain discrepancies in the urine such as low specific gravity, absence of polyuria, together with absence of the physical symptoms of diabetes and a history of the taking of one of the drugs mentioned, will excite suspicion of error, and an appeal to the fermentation or phenylhydrazin test will clear away all doubt. The latter is the most reliable qualitative test for sugar, as that substance is the only urinary product which produces the characteristic reaction. It is an excellent appeal test when the indication of the copper reduction method is doubtful. Its application, however, consumes some time, and the phenylhydrazin is inconvenient to handle and very irritating to the skin. Havelburg's modification will be found much easier to carry out than the original method of Von Jaksch. It is applied as follows. Place 20 grs. (gm. 1.20) of phenylhydrazin hydrochlorate and 30 grains (gm. 1.80) sodium acetate in a test tube and fill almost half full of distilled water and slightly warm. An equal quantity of the urine is now added and finally a little chloroform, and the mixture shaken. If the test tube be allowed to stand the chloroform soon settles to the bottom, and if sugar be present a layer of fluid forms above it, containing the crystals of phenylglucosazone. Some of this layer of fluid is gently withdrawn by a pipette and mounted on a slide, and examined under the microscope for the characteristic crystals.

Having established the fact of the presence of sugar in the urine it remains to determine its quantity. This should be invariably practiced in cases where sugar is found in the urine, for by the knowledge so gained we are assisted to a definite understanding of the disease and its prognosis. Repeated estimations will enable us to closely watch the progress of the case and observe the effects of treatment. It is not now the unsatisfactory procedure that it once was. Modern methods have done much to simplify the process and now with inexpensive apparatus and the expenditure

[1] New York Medical Journal, July 27, 1895.

of a few minutes of time the knowledge so essential to the conduct of the case can be gained.

The methods most used are the fermentation method, optical saccharimetry. Fehling's method by titration and the ammoniated cupric tests, which include Pavy's and Purdy's methods. I have adapted my own method previously described for the detection of sugar so that it may be employed for quantitative estimation after the manner of the ammoniated cupric tests. A comparison of the different methods just enumerated will not fail to demonstrate the superiority of this class of tests. As they require but a few minutes for their application the estimation may be made without delay, indeed while the patient waits, an important practical advantage which the others do not possess. Furthermore the results are accurate, uniform and reliable.

The advantages which characterize my method as a qualitative test render it also especially applicable for quantitative estimation. It is a test which is easily applied and possesses a singularly clear and transparent end reaction. The principle of the method in common with the others of the ammoniated cupric class is that the cuprous oxid formed by the reducing power of the sugar is held in solution by ammonia which is added for that purpose, the test remaining clear and transparent throughout, the end reaction being the complete disappearance of the blue color.

The test is employed by taking 133 minims of the cupric oxid solution (No. 1) in a narrow necked glass flask and adding thereto 6 drops of the tartaric acid solution and 3 drams (cc. 12.) of liq. am. U.S.P. Mix thoroughly and add distilled water to raise the total volume to two fluid ounces (cc. 64). The resulting solution is perfectly clear and transparent. This amount of test solution so prepared represents in sugar value one-fourth grain of grape sugar, that is, it is reduced and decolorized by exactly that amount of sugar. The necessary apparatus is a glass flask with narrow neck, a retort stand, alcohol lamp and minim pipette. The reagent prepared as described is brought to the boiling point over a spirit flame and while smartly boiling, the urine is added from the pipette slowly drop by drop allowing a few seconds to intervene between each drop until the blue color has entirely disappeared from the test solution. As the color fades it is well to proceed more slowly with the addition of the urine. The addition must be stopped immediately the color has entirely disappeared and the number of minims employed should be noted. To facilitate observation of the progress of decoloration a white background may be used. If now 480 minims (cc. 32) be divided by the number of minims required to decolorize the test and the quotient be divided by 4 we obtain the number of grains of sugar to the ounce of urine. Knowing the total excretion of urine it is a simple matter to estimate the total loss of sugar for the twenty-four hours. If the urine be heavily charged with sugar greater accuracy may be obtained by diluting it before testing with 2 volumes of distilled water and multiplying the result by 3. There is no difficulty in determining the exact point of complete reduction. After decoloration the solution is clear and transparent with a slightly opalescent hue. In clearness of reaction this test excels all others of its class. This is due partly to its extreme delicacy and also to some extent to the fact that it is freshly prepared for each application. Notwithstanding their alleged stability the other tests deteriorate to some extent after being kept for a length of time and this detracts from the clearness of their end reaction. It is well to bear in mind the following precautions in applying this test. If the urine be dropped in too slowly and the boiling is thus much prolonged some suboxid may be thrown down because of evaporation of the ammonia before decoloration is complete. The test solution should be kept steadily boiling until reduction and decoloration are complete, as any interruption of ebulition will permit the entrance of air to the solution, thus producing possibly some reoxidation of the reduced oxid, which would render the result slightly fallacious. These accidents with a little care can be readily guarded against. Upon standing after decoloration the blue color gradually returns to the solution. This is owing to absorption of oxygen from the air and the reformation of the blue protoxid from the suboxid held in solution by the ammonia. The accuracy of the results of this method may be verified by the employment of a solution of known strength of chemically pure grape sugar in distilled water or normal urine.

Microscopically there is nothing characteristic in the urine of diabetes mellitus unless it be the presence of yeast plants (saccharomyces urinæ). These little cells when present may be takan as positive evidence of the presence of sugar. I have frequently observed that highly saccharin urine is very prolific in mucus cylindroids. These are due no doubt to irritation of the mucous surfaces by the highly acid abnormal urine.

In view of the frequent development of interstitial changes in the kidneys during the progress of diabetes and the important bearing which such have upon the prognosis it is well from time to time to submit the urine sediment to careful microscopic inspection for casts. The frequent association of casts and diabetic coma would furnish other reasons for care in this direction. The sediment of diabetic urine is as a rule very sparse. The high density of such urine greatly delays the deposition of the light hyaline casts in the sediment and thus renders their detection often very difficult. Since the introduction of the centrifuge into urinary work this difficulty has been overcome. In the sediment obtained by centrifugal force these casts if present can always be detected.

The irritation of the urinary passages by the highly acid abnormal urine and the lowered vitality and powers of resistance always present in these cases, result in the frequent occurrence of suppuration at some point of the urinary canal. If such be present the microscope will reveal the characteristic pus and epithelial elements.

Not the least among the advantages to be derived from analysis of the urine in this disease is the discovery of certain conditions which may develop during its course, which have an important bearing upon prognosis and treatment. For this reason frequent pains-taking uranalyses should be made; for by their early detection we are often warned of impending danger and may be enabled by instituting prompt measures to evert or postpone some grave complication. In this manner a sudden fall in specific gravity and the excretion of sugar and urea without corresponding amelioration of the physical condition should be regarded with apprehension as these phenomena frequently preceed diabetic coma. The urine should be at once submitted to the ferric chlorid test. Of the significance of this reaction Halliburton says: "What-

ever the substance may be that causes the reaction, its appearance is of grave import often foretelling the onset of coma and death." According to this authority ethyl-diacetic acid is the cause of the reaction. Von Jaksch also considers that it often forebodes diabetic coma, and Bouchard in his valuable work on "Auto-intoxication" ascribes to it considerable value as a prognostic sign. He says: "In nearly all cases of diabetic coma, perhaps in all, we find this color reaction of the urine. . . . In diabetes this reaction may serve as a basis of diagnostic and prognostic indication." Bouchard states his belief that the substances producing this reaction are the result of defective elaboration of matter by the human organism and are largely formed in the intestine. Among these substance are acetone, diacetic acid and oxybutyric acid, all of which are poisonous. From these statements we might expect that careful regulation of the diet and a course of intestinal antiseptics and digestants with measures to combat constipation if instituted early in the disease and persistently maintained would have a decided effect in postponing this fatal complication. With this color reaction, a fruity chloroformic odor of the breath and urine, an excess of indican and an increase in acidity of the urine are frequent accompaniments.

The appearance of renal casts is also significant of developing coma. In twenty cases of diabetic coma Sandmeyer found numerous casts in every instance. They were present both during the prodromal symptoms and when the coma was marked. Kulz more recently in observations conducted in 400 cases likewise found casts both before and during coma. No difference was noted in their number whether the coma terminated fatally or in temporary recovery. The latter event was followed by disappearance of the casts from the urine. A small amount of albumin was frequently but not invariably present. The appearance of casts would seem to be a prognostic sign of value in these cases. In this connection care must be exercised not to mistake for casts the cylindroids so commonly present in diabetic urine and which often bear a strong resemblance to light hyaline casts. It is also well to bear in mind the fact that casts are frequently present in the urine of diabetics due to interstitial changes in the kidneys brought about by prolonged irritation. Prognostic significance can only be attached to their appearance when the urine has previously been quite free from them.

Albuminuria is a symptom of frequent occurrence in diabetes and is therefore worthy of attention. Bouchard has pointed out that it is present in 43 per cent. of cases. Smitz found that in 1300 diabetics 824 were also subject to albuminuria. Marie alleges that such cases are principally arthritic diabetics. The albuminuria is usually slight, frequently but a trace of albumin being present, or it may reach one gram in the twenty-four hours, beyond which amount however it seldom goes unless complications exist. The prognostic importance of this sign depends upon the grade of the albuminuria and more especially upon the association of symptoms of Bright's disease. If the latter be associated with it the prognosis is grave. The following are some of the most frequent causes of albuminuria in diabetes:

1. Irritation by the sugar during its excretion, bringing about degenerative changes of a hyaline character in the small arteries and the epithelium of the renal tubules.

2. Suppurative conditions of the urinary passages to which diabetes are so predisposed.

3. The largely increased ingestion of albuminoid foods.

4. The increased liability of diabetics to various morbid changes because of poor nutrition and lowered resistence.

5. Derived albumin the result of dissimilation.

6. A coëxisting nephritis.

In rare instances the albuminuria and glycosuria may alternate. These cases Sir Dyce Duckworth considers of a gouty nature. The albuminuria has been known to substitute the glycosuria, sugar disappearing entirely from the urine. When albumin is present a microscopic examination should invariably be made. Occasionally a case is met with in which the degenerative changes in the kidney progress and assume the ascendency. The nephritis becomes in time the more threatening condition and may eventually prove fatal. In their management these cases present many difficulties to the physician, an exceedingly nice adjustment of the diet being necessary to hold in check the two diseases. Disappearance or marked diminution of the glycosuria upon withdrawal of starches from the diet is a favorable indication.

Lastly the longer the glycosuria persists the more unfavorable is the progress.

Auditorium Hotel.

SERUM THERAPY IN TETANUS—WITH CLINICAL REPORT.

BY T. A. DEWAR, M.D.
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August 2, I was asked to see a boy suffering with a sore neck and back, which his father regarded as being myalgic in nature. On arriving at the bedside at 10 A. M. my attention was at first attracted to a sore foot protruding from beneath the bedclothes. On inspection the wound proved to be an ugly laceration on the sole, over the base of the fifth metatarsal bone, which was carefully sealed up with court plaster, care being taken that none of the pus should escape. I at once tore off the plaster and pushed my thumb deeply through the foul wound, preparatory to sterilization. While scraping out the wound with my thumb the boy, to my surprise, suddenly assumed the position of opisthotonos, no part of the body touching the bed except his heels and the back of the head, the body being arched almost to the extent of a semicircle. I recognized the clinical picture of tetanus; tetanic spasms, spastic masseters with trismus, retraction of the head, the risus sardonicus, rigidity of the cervical, dorsal and lumbar muscles, with intense constitutional disturbance; pulse 135, respiration 21, temperature 100 degrees F.

I at once stayed proceedings and took his history, which I present as follows: H. McD., male, age 11, family and personal history excellent. July 24, patient stepped on some broken glass, receiving the lacerated wound described above. No attention was paid to it, except to apply court plaster, and patient made no complaint and appeared as well as usual till July 31, when slight impairment of mastication and deglutition was noticed. The following day he became progressively worse and complained repeatedly of intense stiffness of his neck and back, which in fact were in a spastic condition. At this time mastication was impossible and deglutition very dangerous.

The following day, the third day after the development of the spastic condition, I was consulted. Recognizing the gravity of the situation, I quickly summoned Dr. E. M. Houghton, and after making a confirmatory diagnosis and giving a decidedly unfavorable prognosis we agreed that in the matter of treatment our only hope lay in the use of tetanus antitoxin (antitetanic serum), combined with full doses of chloral, together with absolute isolation in a quiet, dark room, with only one attendant. At 11 A. M., the first injection of serum was made (10 c. cm.) under strict antiseptic precautions, it being necessary to give a whiff or two of chloroform to allay the spasm during the introduction of the needle. At this time pulse was 140, temperature 100 degrees. The slightest noise or touch threw the patient into violent spasms; teeth were set tightly; patient suffered extreme pain and absolutely refused all nourishment.

Patient was next seen at 5 P. M. Nurse reported nine spasms since last visit. Patient did not complain of pain; was willing and able to talk, and the effort did not excite spasm; said he was comfortable and suffering very little compared with his condition six hours previous. While we were present he took one ounce of milk which he swallowed with comparative ease. We were able to touch patient at this time without exciting spasm. Pulse was fuller, of the same frequency; temperature 98.4 degrees. Injected 10 c. cm. serum without using chloroform and without exciting spasm. It was noticed that perfect absorption of the first injection had taken place, leaving no soreness. Giving instructions to the nurse to allow milk freely, we left him in comparative comfort. Next seen at 11 P. M. Six spasms reported, indicating much less frequency. Patient asked for milk and drank a glass with ease; also asked for water; appeared inclined to take nourishment. He was asked to separate his jaws, which he did sufficiently to admit a lead pencil. Attendant first noticed the ability to separate the jaws about 7 P. M. Dr. C. T. McClintock, of the University of Michigan, accompanied us at this time and after careful deliberation expressed a hopeful prognosis. Patient appeared more cheerful. Pulse 140, temperature 98.4 degrees. Injected for the third time 10 c. cm. serum. Left patient at midnight, both physicians and friends very hopeful of results.

Just at this point our hopes were suddenly blasted by the adverse attitude of the patient's father to us. The father had spoken to another professional friend of his, a man with ancient methods. This physician disparaged our methods and that "stuff," the serum, to such an extent as to secure our immediate discharge, he promising to "pull the boy through all right." We offered to furnish serum gratis that our treatment might be continued, but it was declined. Under the new management treatment was commenced at 2 A. M. At 2:30 A. M. the patient instead of having from two to three spasms an hour, suddenly began having spasms at the rate of 200 per hour and ten hours later died.

In reviewing the above case one can not but be impressed with the favorable course the case was assuming. Among the most desirable and prominent results of the serum treatment we might mention the relaxation of the trismus eight hours after the inception of treatment; the reduction of the temperature (axillary) from 100 degrees to 98.4 degrees; the reduction in the frequency of the convulsions; the return of the patient to comparative comfort; his desire and ability to take nourishment; and above all the rapid increase in frequency of the convulsions from three per hour under the serum treatment, to 200 per hour a few minutes after our methods were supplanted by those of more ancient date, and the death of the patient ten hours after the older methods were commenced. Our experience with this case was short, but sufficient to warrant us in coming to the conclusion that the antitetanic serum exerted a powerful influence for good. While awaiting further statistics we wish to emphasize the importance of early treatment and strongly advocate the serum as a prophylactic in cases of suspicious looking wounds.

281 Meldrum Ave.

THE BACTERIOLOGIC CONTAMINATION AND THE PRESERVATION OF VACCINE LYMPH—GLYCERIN AS A BACTERICIDE.

Read before the Chicago Pathological Society, Oct. 12, 1896.

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The present communication is the outcome of observations made during the past two years, at the request of vaccine propagators, regarding the best methods of preserving vaccine lymph. It is our purpose to refer briefly to the contaminations by bacteria occurring in bovine vaccine lymph with their effects and to the measures which have been found useful in preserving the virus. No reference will be made to humanized lymph, as the danger of syphilitic infection through its use has practically stopped its employment.

The bacterial contaminations may be divided into two classes: The saprophytes or non-pathogenic, and the parasites or disease-producing. The former are of moment, because by their presence and growth the virus is decomposed and by some at least is robbed of its specific property. The pathogenic variety may cause various disease processes in the human subject when virus containing them is employed for vaccination.

Abundant observations have shown both of these varieties to be present almost constantly in the lymph dried upon ivory points, as well as in fluid lymph to which no preservative has been added. The cloudiness of such vaccine lymph after keeping a short time has been found to be due to the growth of saprophytic bacteria. Fütterer examined seventy-five ivory points from different sources and found the staphylococcus aureus in about fifty-five, the staphylococcus albus in about the same number, and the streptococcus of erysipelas and phlegmonous inflammations in ten. The pyogenic staphylococci have been found frequently by other observers (Woitlow, Grigoriew, Straus, Copeman and Crookshank). The streptococcus has been found less frequently (Copeman, Woitlow). Reed examined vaccine points from six vaccine farms and found the staphylococcus albus and aureus in all the plates. We have made cultures from four different makes of ivory points which are sold in largest numbers in the Chicago market. They were obtained as fresh as possible in the original packages. In every instance they proved

to contain large numbers of bacteria, and in those from each source the pyogenic staphylococci were found. Fluid lymph from a prominent firm was cloudy and contained innumerable bacteria.

The culture you see here was made from an ivory point purchased in the Chicago market recently. It was removed from the original package with sterile forceps, dropped into the liquefied nutrient agar-agar at 45 degrees C., and after standing a few moments the agar was poured into a sterile Petri dish. You see the large numbers of colonies of bacteria present.

The almost universal presence of pyogenic bacteria in virus furnishes a reasonable explanation of the common suppurative, phlegmonous and erysipelatous inflammations following vaccination. Whether other varieties of pathogenic bacteria are at times present in vaccine lymph is not certainly known. Abundant cases of tetanus following vaccination have been reported in medical literature. It is not difficult to imagine that the tetanus bacillus may gain entrance to the lymph where proper precautions are not taken in its collection, as it is so commonly found in the dust and refuse about stables. It is not known whether the tubercle bacillus can enter the lymph from a tubercular animal. E. Peiper refers to the report of Toussaine, in which he claims to have produced tuberculosis in a rabbit by inoculation with virus from a tubercular cow. Peiper vaccinated sixteen phthisical persons and could not find tubercle baccilli in the lymph after most careful search. Josef Acker concludes that no tubercle bacilli are found in the vaccine vesicles of tubercular individuals before or after the seventh day. It is hardly fair to conclude from these observations on human subjects that the same would hold good in the cow. However this may be, the danger from tubercle bacilli can be eliminated by using animals only after the absence of tuberculosis has been demonstrated by the use of tuberculin. We have not been able to find any cases recorded of infection with anthrax or glanders by vaccine lymph.

Knowing of the frequent presence of certain pathogenic bacteria in vaccine lymph, we naturally demand a preparation in which they are not found if we expect to have typical vaccinations and to avoid severe if not fatal sequelæ. Evidently it would be desirable to obtain sterile lymph, unmixed with any preservative or foreign material. To learn whether this was practical, we made inoculations on 5 per cent. glycerin-agar-agar from the surface of vaccine sores of six cows on the fifth day, after they had been thoroughly cleansed by washing with soap and water, followed by solution of $HgCl_2$ and sterilized water. The inoculations were made by scraping the surface with a heavy platinum needle. From two cows, cultures of the staphylococcus aureus were obtained with an unidentified bacillus, from two a streptococcus corresponding in all its cultural properties to the streptococcus pyogenes, from one an unidentified bacillus, and one was sterile. All the sores were typical. These observations convinced us that it was useless to hope to obtain primarily sterile lymph, especially as the operators are not usually well skilled in antiseptic technique. Surgical wounds when managed according to the most careful antiseptic and aseptic principles have been found at the end of operations to contain a few bacteria. In a healthy wound these are destroyed by the wound secretion or tissue cells. In vaccine lymph, however, this is not the case, but a good nutrient material is furnished for their growth.

Various measures have been employed, at first empirically and later for scientific reasons, to preserve the activity of vaccine lymph. It was found by Carsten and Coert, in 1875, that sufficient heat to destroy the bacteria in lymph was also enough to destroy the vaccinal principle.

The method of Reissner was to obtain lymph, dry it over sulphuric acid and reduce it to a powder. The dry powder was found to preserve its properties up to twenty-nine days, and in later observations for a much longer time. The drying effectually prevented the growth of saprophytic bacteria, but did not injure the specific agent of vaccinia. This method became very popular and yielded good results.

Pissin pulverized the crusts and made a mixture with glycerin and salicylic acid water, which he stored in capillary tubes. This remained virulent as late as three weeks, as long as tested. Other observers have found it active for much longer periods.

Attempts have been made to preserve the lymph by adding various chemicals. R. Pott experimented with salicylic, boric and carbolic acids, and thymol. He concluded that after a time they injured the virus and did not in any way conserve the lymph.

The use of glycerin was placed upon a rational basis by the observations of Copeman, Chambon and Ménard and Straus. They found that the lymph diluted with glycerin at first contained more or less numerous bacteria of various kinds, but that the glycerin prevented their multiplication and in a few days lead to the death of most of them. Lymph from the same source to which no glycerin was added and which contained only the same proportion of bacteria primarily, in a few days was swarming with bacteria. With the growth of the bacteria the vaccinal properties of the lymph was destroyed. The addition of glycerin did not in any way lessen, but rather enhanced the activity of the virus. Chambon and Ménard found that while fresh lymph might produce bad results, if kept two weeks and later typical pustules were produced.

King obtained with lanolin similar results to those with glycerin.

We have repeated these examinations in a series of twelve samples of lymph. In each case lymph was obtained as soon as possible after being taken from the animal, with all precautions to prevent contamination. It was placed in capillary tubes, part in the pure state, part after being mixed with pure glycerin or equal parts of glycerin and distilled water. The pure lymph always contained a few bacteria in a few hours (three to six in a tube) and in from three to five days became cloudy and contained innumerable bacteria. In the lymph diluted with glycerin a few bacteria were also found at first, but as it was kept they became gradually fewer and disappeared in from eight to thirteen days. An exception occurred in one lot of lymph in which the bacillus subtilis was obtained in cultures after twenty-four days, but it did not increase in numbers. The glycerin lymph always remained perfectly clear and transparent as long as kept. Whether pure glycerin or equal parts of glycerin and water were used did not appear to alter the results. Virus from several of the lots was tested as to its vaccinal properties after it had become sterile up to as late as one month, with the result that it produced typical pustules. The percentage of glycerin did not appear to modify its effect.

There are here a series of cultures made from lymph

taken Sept. 18, 1896. The lymph was placed in capillary tubes, part in a pure state and part after diluting with glycerin. We have made cultures from each at intervals, and you see the results. Those from the pure lymph show a few colonies in the culture made thirty-six hours after the lymph was taken from the animal, and the colonies rapidly increase until on the seventh day they are innumerable. The earlier cultures from the glycerin lymph also show a few colonies, but these become less in number in the later cultures, until on the fifth day none are found. You will also note the difference in the appearance of the lymph in the two capillary tubes; the pure lymph has become cloudy; the glycerin lymph remains perfectly transparent.

A series of experiments was also undertaken to determine the action of glycerin upon pure cultures of various bacteria. The forty-eight hour growth upon agar-agar of the bacteria in question was introduced into test tubes containing sterile glycerin and equal parts of glycerin and water. Control tubes containing a sterile solution of sodium chlorid were employed, the same cultures being introduced at the same time. All the cultures of pathogenic bacteria were virulent. At intervals inoculations were made from these upon nutrient agar-agar. The effects of the pure glycerin and glycerin and water did not differ. The staphylococcus aureus was dead in from five to twenty days. Where the longer time was required a very large amount of culture was introduced into the glycerin. The streptococcus pyogenes was dead in five days, even if introduced in considerable quantity. The bacillus mallei was dead in two days. There was little or no effect upon spores. The subtalis bacillus grew for a month (as long as tested), and the anthrax bacillus was viable and virulent after five months.

From these experiments we may conclude that glycerin has a distinct germicidal action upon many free bacteria, destroying most of those of a pathogenic nature likely to be found in vaccine lymph inside of two weeks, but having little or no effect upon spores. Copeman, in 1893, states that he found that while some pathogenic organisms remain active in admixture of broth and glycerin, or even pure glycerin, for longer or shorter periods, other pathogenic and, so far as his experiments go, all saprophytic organisms, are killed out in from three or four days to as many weeks. The practical application of these facts and observations are easy. Until we know what the active agent of vaccinia is, and can obtain it in pure cultures, we must depend upon the cow for propagation of our virus. If we can procure a virus which is free from bacteria, it is our duty to use it. Such a virus is found in the glycerin lymph, and is being offered to the profession by many vaccine propagators. One objection urged against it is that it is slow to dry, but the element of time is of no vital moment. How much time is lost by persons going about with an arm in a sling for days? It would be as consistent to object to aseptic surgery from the same standpoint. With a sterilized field of operation and a proper protective dressing, secondary infection in the vaccine-wounds would be extremely rare.

The ivory point, as at present prepared, should be discarded. They can not be obtained free from bacteria. The practice of supplying vaccine points to druggists to retail and handle with septic hands is especially pernicious.

It is not our purpose to discuss the technique followed in vaccinating cows and in obtaining the serum. It is sufficient to state that the lymph used to inoculate the cows should be preserved as if to be used for human vaccination; that the operating room should be cared for in the same way as one used for surgical purposes; and that the seat of inoculation, the hands of the operator, and all instruments and vessels used should be carefully rendered aseptic. The vaccine sore should be made as nearly free from bacteria as possible before the lymph is collected, and the vessels in which the serum is received and the capillary tubes in which it is stored should be rendered sterile by heat. We may briefly summarize as follows:

1. Vaccine lymph in a fresh pure state almost always contains bacteria, and often pathogenic forms.

2. Pure vaccine lymph after keeping in a fluid state, or dried upon ivory points as now prepared, is unfit for use and often dangerous.

3. Vaccine lymph diluted with pure glycerin or equal parts of glycerin and distilled water, becomes sterile in about two weeks, and should not be used sooner.

4. All animals used for propagating vaccine lymph should be tested with tuberculin before being used.

5. All vaccine establishments should be regularly inspected by properly qualified officials, and samples of virus from each lot of vaccine examined bacteriologically by a competent person and the result certified before it is placed upon the market.

6. Each package of vaccine lymph should be so marked that the date on which it is taken, and, if fluid, what has been added to it, shall be shown.

In conclusion, I desire to express my thanks to Prof. Walter S. Haines for valuable suggestions and to Dr. E. M. Wood for kindly furnishing material for carrying out part of these experiments.

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SOCIETY PROCEEDINGS.

Chicago Academy of Medicine.

Regular meeting Nov. 13, 1896.

(*Concluded from page 1297.*)

Dr. E. T. DICKERMAN, continuing the discussion, said:

In regard to the treatment of empyema of the frontal sinus and also of the ethmoidal cells, there is only one treatment wherever there is pus, and that is to evacuate the pus and establish drainage. How can this be done in these cavities? For the frontal and ethmoidal cells there is practically but one method, namely, the internal, removing the anterior third of the middle turbinated body. Sometimes you will find along the processus uncinatus a thickening which will have to be curetted away. By so doing you will establish free drainage. You can not expect in these cases to effect a cure in two weeks or three months. In some instances it takes a long period of time to bring about a cure, and this will depend largely upon the perseverance not only of yourself but of the patient also. It requires thorough cleansing on part of the patient and thorough irrigation of the cavities by yourself, together with the removal at any time of granulation tissue which is continually springing up wherever you have pus running over a mucous surface. If your treatment is thoroughly carried out, undoubtedly your cases will get well. The recoveries are not only brilliant from your standpoint, but they are eminently satisfactory to the patient.

In regard to the effect of this disease, we have symptoms of pain which is referred to the trigeminus. It may be local, or may be projected to any part of the head. We also have the constant presence of secretions or of pus; there may be occlusion of the naris. There is another important symptom, and that is, during sleep there may be a purulent or muco-purulent discharge which is continually flowing backward. The patient at night unconsciously swallows this, and then we get not only toxemia from absorption of the pus, but we establish in the gastro-intestinal tract of the patient a catarrhal condition which is manifested by various digestive disturbances. A certain amount of this purulent matter is deposited on the posterior pharyngeal wall, which very often brings on vomiting. These patients lose flesh very rapidly, but under treatment and the thorough cleansing of the parts and getting rid of the discharge, I have seen them gain as much as twenty pounds in a month. This is a subject upon which I feel very strongly, and is one that should always be considered in all cases of indigestion in which there is vomiting in the morning. After the discharge has stopped, the patient will make a good recovery.

A few words in regard to the treatment of the antrum and I have done. Opening through the alveolar process has never proved satisfactory with me, only in those cases that we might call subacute, in which the patient has either lost a tooth or the infection has been through the mouth, or the disease has followed some acute exanthematous affection, pneumonia, or something of that sort, then opening through the mouth with thorough washing two or three times and allowing it to heal, you get a complete recovery.

There is another way to treat these cases which is equally as satisfactory. It is not by the method of Krause, but a method recently devised by an American, Dr. Walter Freeman, of Philadelphia. It is a method which to me seems most rational. There is very little inconvenience to the patient in resorting to it. Dr. Freeman enters the antrum through the inferior meatus anteriorly with a drill, then introduces a trocar and canula which is allowed to remain, followed by a thorough irrigation. This treatment is not irritating to the patient as a rule, and he is able to wear the canula easily. In the method of Krause the introduction of the trocar causes considerable pain and discomfort to the patient, while with Freeman's treatment I think the majority of cases will do equally as well and not be inconvenienced nearly as much.

Dr. WILLIAM L. BALLENGER—I shall not speak of the infectious diseases which cause disturbance in the accessory sinuses, except one that has not been mentioned. I refer to ozena. My observation has led me to believe that some of the cases of obstinate ozena are not cured, for the reason that we do not enter the accessory cavities and thoroughly rid them of the bacillus of ozena. Ozena is undoubtedly due to a bacillus, and it is a cause of disease of the accessory cavities. This being the case, our method of treatment must in some cases extend to the accessory cavities, or else we will fail in getting the proper results. I have been making some investigations along this line and hope at some future time to make a report on this subject. Exploring the antrum with a curved syringe point is certainly preferable to making an exploratory puncture through the aveolar process. I find it is very essential to treat the acute cases for fear that they may become chronic, as they do in many instances. I do not agree with Dr. Gradle where he said that it was probably not best to attempt any treatment in the acute cases. As has been said by Dr. Dickerman, the natural openings of the accessory cavities are closed by swellings or hypertrophy of the middle turbinated body, or by hypertrophy of the tissues thereabout. This hypertrophic process continues simply because the openings are occluded. By using some simple remedies, such as aromatic and astringent washes, cocain, antipyrin, etc., we can render these cavities patulous and thereby establish aeration and drainage, a cure will oftentimes follow as a result. I think that it is very essential that we should resort to some simple method of treatment in the acute cases In catarrh of the frontal sinus we may have a persistent headache, which is sometimes immediately relieved by washing out the nasal cavity thoroughly, applying cocain, and antipyrin to maintain the effect of the cocain longer, and then by inflations of chloroform vapor with a Politzer bag, we enter the cavity at once and relieve the patient of a very distressing headache.

I must protest against non-interference in the acute cases. The main part of the paper I agree with and heartily endorse.

Dr. W. L. BAUM—I would mention one affection which I believe is frequently associated with disease of these sinuses, and in so doing I would ask Dr. Gradle in closing to answer the question as to whether erysipelatous conditions are not intimately related to sinus disease. Within the last two years I have frequently noted the fact that in recurrent erysipelatous conditions of the face, particularly where the infection seems to arise from the neighborhood of the nose, that patients have been subsequently operated upon for diseases of the sinuses, not, of course, during the erysipelas attack, and the operation resulted in a cure of the erysipelatous infection. This is a subject of great interest, not only to rhinologists, but also to the general practitioner, because all of us see more or less frequently cases of recurrent erysipelatous infection. I do not believe we have an erysipelatous condition which is idiopathic, and if we look for it we will find pus in every case. I have seen a number of cases of this kind in the Cook County Hospital complicated by disease of the frontal sinus, because the patients complained of long and persistent headache, the headache becoming more aggravated at the beginning of the erysipelatous infection.

Dr. E. S. TALBOT—A few thoughts have come to me that have not been touched upon by any of the speakers. In the preparation of the chapter of my book[1] on the subject of deformities of the nose and antrum, about 11,000 skulls were examined, 3,000 of which were broken sufficiently so that I could examine the antrum, making about 6,000 antra altogether, taking both sides. I do not understand how a person can intelligently treat disease of this cavity without first knowing something about its anatomy. You would be surprised to see how few of these cavities are uniform in their development. Gray speaks of the cavity as being a triangular cavity, its apex directed outward; its base the outer wall of the nose. I venture to say that less than one-third of these antra possessed that shape. Some of them were very small, much smaller than the average antra mentioned by Gray. One of these antra may be divided into a number of cells, and you can see how absurd it would be to examine an antrum of that kind with a light, because of the fact of its being filled up with bony cells. Sometimes these little cells are located below the orbit and the lower part of the antrum is entirely filled up. In a larger number of cases there were one or two, or possibly three septa, dividing the antrum in three or four parts. In some cases the floor of the nose would be found extending over the alveolar process. I have seen them frequently extending half way and again across the alveolar process. In these cases the antrum would be small in size.

In the last ten years I have had two patients come to me who have had openings drilled from the palatine root of the first molar tooth into the floor of the nose. I thought that the person who operated upon these jaws must have had a poor knowledge of the anatomy of the parts. When I came to examine skulls and saw how many of those were deformed and the floor of the nose extended over the alveolar process, I could readily see how any man by making an opening through the palatine root of the first molar tooth would penetrate the floor of the nose. In examining these 6,000 antra I found the lowest point was invariably situated between the root of the second bicuspid and the first permanent molar; that this cavity extended forward and upward. Therefore, the proper place, according to the examinations made would be just midway between the root of the second bicuspid and the first permanent molar on the outer side of the alveolar process. Dr. M. H. Fletcher, of Cincinnati, in 1893, after examining 1,000 antra, arrived at the same conclusion. I do not see how it is possible for a man to treat the antrum by making an opening through the middle meatus of the nose. You would strike the antrum about midway, and therefore you do not get the lowest point for drainage.

I was pleased with the remarks of the essayist in regard to the etiology. Many dentists and some physicians are of opinion that antrum troubles are in most cases due to abscessed molar teeth. Dr. Fletcher and myself are not of that opinion, but agree with the essayist that most troubles are due to infection through the opening in the nose. Dr. Fletcher says: "In 1,000 antra I find 252 upper molars abscessed, making 25 per cent. of antra which have abscesses in this locality for every fourth antrum. This per cent. is probably smaller than it should be, since many teeth were lost and the alveolar process absorbed away, and undoubtedly some of these lost teeth have been abscessed. Out of the 252 possible cases perforation into the antrum was found only twelve times, thus showing over 4½ per cent. or about one in every twenty-one of the abscessed teeth in this locality which are connected with the antrum." In the treatment of 367 cases of pulpless molar teeth I found only 3 per cent. of diseased antrum. Dr. Fletcher found in 224 cases of pulpless molar teeth treated by him only one case of pus in the antrum. Dr. Bonwill, in a practice of forty years, has only had two or three cases of pus in the antrum. It will be observed then that the teeth rarely cause antral disease.

In the treatment of the antrum I should never think of flushing or draining it without having the patient lie with the head down in order that the fluid might be carried over the septa and out of the opening at the lowest point in the floor of the cavity. This should be done in all cases, since we are unable to define the shape of the cavity in living subjects.

Dr. HENRY GRADLE (closing)—I stated in the beginning that my paper was not by any means formal or dogmatic, but rather a rambling discussion of personal experience. Perhaps that accounts for the manner in which I have been misunderstood in reference to some points. I did not say that there should be no interference in acute cases. I only said, as a rule, I would not favor surgical interference. First of all, in treating such patients they are generally too sick with some other disease to stand much manipulation. Many of the cases are self-limited. On the other hand, I have favored the use of douches, provided due care be exercised in guarding against danger to the ear. Furthermore, in all of those cases where pain exists and can not be controlled by antipyrin, which is generally sufficient, I should favor a temporary opening into the antrum or an attempt to syringe through one of the natural openings. When it comes to the ethmoidal or frontal cavities, syringing through the natural opening is difficult, and I can not succeed in doing it in 50 per cent. of the cases, as has been mentioned by Dr. Dickerman. Engelman tried it on cadavers after making a counter-opening, and found that the frontal and maxillary sinuses can be irrigated only in a small percentage of cases. The question of ethmoidal diseases I barely touched upon. It is a noteworthy fact, however, that Fraenkel found not a single instance of ethmoidal disease, although he examined the ethmoid in every case. Zuckerkandl and others also speak of ethmoiditis as not being very frequent. Cases of necrosis of the ethmoid bone have been reported, but are not very common. I remember within the past year to have had a case in which I felt sure there was necrosis in the anterior cells. It seemed so with a probe. There was certainly suppuration from the cells. But on examining the middle concha after amputation I found no evidence of bone disease. Examination with the probe is not absolutely trustworthy as a guide in disease of the ethmoid cells.

The importance of attention to the infundibulum I can endorse. It requires the closest attention to this region to remove all polypi and granulation tissue, to irrigate with fine tubes, not necessarily with the intention of reaching into the sinus, but simply to clean the region between middle turbinal and the external nasal wall. I have been misunderstood about my operations on the maxillary sinus. It seems there is as much discrepancy among the members of the Academy as to results and methods of operating in these cases as can be found in the published literature. Ziem has had over a thousand cases, and he says there are very few cases that do not get well if you open through the alveolar process and irrigate. Jansen of Berlin, on the other hand, never saw a single cure of maxillary empyema by any method until he resected the front wall of the antrum, and then it took from one to two years before the patients got well. There are cases which do not get well with any method of treatment, except in the course of years, after extensive resection of the anterior wall of the maxillary sinus. Other cases get well in six weeks to three months, after irrigating through the alveolar process. I would not condemn this method simply because it fails in some instances. Any method will fail in some cases. Formerly I had a prejudice against the operation from the mouth. In operating through the canine fossa my results were not as good as now. Sometimes at the anterior wall of the canine fossa, at its thinnest point, you can penetrate with a needle. In other patients the wall is thick. There is no natural drainage through the antrum, because pus is too thick to flow. I have made openings large enough to insert the small finger through the canine fossa, and still when I irrigated I would find pus after a few hours. It would not flow out. You can draw it out by means of gauze packing, and the patient feels very well while the packing is there. You can make him feel comfortable by applying the packing once in four or five days, but without extensive resection of the anterior wall gauze packing will rarely lead to a permanent cure.

[1] Osseous Deformities of the Head, Face, Jaws and Teeth.

Chicago Pathological Society.

Regular Meeting, October 12, 1896.

(Concluded from page 1299.)

Dr. JAMES B. HERRICK read a paper on

TRICUSPID STENOSIS,

Reporting two cases and exhibiting a specimen from the second case.

Case 1—A woman, 26 years of age, with no symptoms indicating heart disease during infancy or childhood, first noticed swelling of the feet, shortness of breath, palpitation, cough, two months after giving birth to a healthy child, and seven months before admission to the Cook County Hospital. The physical examination revealed an enlarged right and left heart, a presystolic thrill over the apex, accentuated pulmonic tone, systolic apical murmur, systolic murmur over xiphoid, small, weak pulse. Died in one week.

Clinical diagnosis: Mitral stenosis and regurgitation, relative tricuspid insufficiency. Autopsy showed a heart hypertrophied and dilated in all its cavities. Mitral stenosis, the opening admitting one finger tip. Tricuspid stenosis, opening

admitting two finger tips. No defect of the ventricular or auricular septa.

Case 2—Female, aged 24, bookbinder, rheumatism at 18; two years later a diagnosis of heart disease by physician. Four days before admission to County Hospital gave up work on account of weakness and shortness of breath. Death in one week.

Clinical diagnosis: Difficult on account of feeble action of heart. Autopsy revealed greatly hypertrophied heart, all the chambers enlarged. Muscular structure of the right auricle in particular shows extreme hypertrophy. No defects in the septa. Mitral valve admits one finger tip, tricuspid admits one and one-half finger tips.

In commenting upon these cases the essayist referred to the extreme rarity of tricuspid stenosis. Following Leudet, he made two classes, the congenital and the acquired. The two cases reported evidently fell into the latter class because of 1, the absence in infancy and childhood of symptoms of cyanosis; 2, the history in the one case of childbirth, in the other of rheumatism with subsequent development of cardiac symptoms; 3, the complete closure of the inter-ventricular and inter-auricular septa. The cases resembled the majority of cases of tricuspid stenosis in being found in women and in being associated with diseases of the valves of the left heart. In Leudet's series of 114 cases, with autopsy, only 11 showed tricuspid disease alone. The symtomatology and diagnosis of the affection were also discussed. The study of Case 2, where there was the enormous hypertrophy of the muscular tissue of the right auricle, showed that even the auricle could in a measure compensate for the obstruction at the auriculo-ventricular valve. This helps to explain why the prognosis is not so uniformly bad as one would think, and how it is possible for patients to live even to old age, one of Leudet's cases reaching the age of 64.

DISCUSSION.

Dr. JOSEPH M. PATTON—The interesting case reported by Dr. Herrick is certainly of sufficient moment not to be passed by in silence. The rarity of the lesion itself makes it of great interest. The difficulty of diagnosis adds to the interest as does the uniformity with which tricuspid stenosis is associated with mitral stenosis, and this is admitted by nearly every author. A great many authors say, among them Hayden, that tricuspid stenosis rarely or never occurs except in association with mitral stenosis. Today this is not regarded as a fact, because in the last few years a number of cases have been observed where the postmortem proved that tricuspid stenosis does occur alone. A good many of the text-book authors tell us that the murmur of tricuspid stenosis will be a presystolic murmur. I think that is based in part on theory, simply because of the presystolic mitral stenotic sound. The fact is that the murmur of tricuspid stenosis is at times not presystolic, it may be, but it is at times a diastolic murmur. It is very difficult to place the time exactly of a tricuspid stenotic sound. I have only heard one such murmur where a postmortem of the patient was obtained and that murmur was diastolic, or, at least, that portion of it which might be called presystolic was so covered by the associated sounds that it was impossible to demonstrate it clinically as a presystolic murmur. Hayden points out that, on account of the association of tricuspid stenosis with mitral stenosis, a strong diagnostic point may be made of two presystolic murmurs that are heard, one being heard in the mitral area, and the other in the region of the xiphoid, and between these two an open area in which no sound can be heard. That appears to be also largely theoretical, because the area of transmission is usually not so definitely limited as to give us such an open area. It seems to me, that from the history of the first case recited the clinical diagnosis might have been modified, from the fact of there being so much dullness transmitted far to the left, and so high, in connection with an apex beat within the fifth space. Such an area of dullness would tend to exclude aortic disease as a factor in the production of the cardiac condition. The specimen is a particularly beautiful one in that it shows well marked and uniform stenosis of tricuspid and mitral openings, and also in the unusual degree of hypertrophy of auricular wall and of the musculi pectinati.

Dr. R. H. BABCOCK—Dr. Herrick has covered the field so fully and admirably in his discussion of this subject, that it seems difficult to say anything which would not be a mere repetition of what has already been said; yet it seems to me, that something more might be added with reference to the prognosis in these cases. It is a matter of very great interest and astonishment that a case of tricuspid stenosis could live to the age of 64 years, and it would be instructive if we could know some of the attendant circumstances pertaining to that patient's life, as well as of some of the associated conditions within the heart. I would ask Dr. Herrick to tell us in that particular instance what other lesions, if any, were associated with the tricuspid stenosis.

Dr. HERRICK—I could not tell without referring to Leudet's thesis.

Dr. BABCOCK—I am interested in this because Bacelli gave an elaborate paper in 1894 on "The Prognosis of Cardiac Lesions," which were of a similar nature. He made the statement that where stenosis of two separate orifices existed, or where insufficiency of two separate sets of valves existed, as, for instance, insufficiency of the aortic valves and insufficiency of the mitral valves, the prognosis, other things being equal, was better than where there was a combination of stenosis and insufficiency, as, stenosis of the aortic orifice and insufficiency of the mitral valves. It would be interesting to know whether in this case there was such a condition as stenosis of the pulmonary orifice and stenosis of the tricuspid orifice. Furthermore, the conditions of the patient's life must intimately affect the prognosis. Under normal conditions the right ventricle is relatively as adequate to its work as the left, yet in any disease which affects the right side of the heart it is much more likely to break down in its compensation than the left. If tricuspid stenosis exists in a congenital case, or if tricuspid stenosis and pulmonary stenosis should concur, the prognosis would be affected not only by these respective conditions but by the circumstances of the patient's life as to daily exercise, physical exertion, etc. If the patient led a particularly quiet life, one not calculated to send the venous blood too rapidly to the heart, the heart might adjust itself to the condition of stenosis and the backward stasis in the other viscera, as the abdominal, would not be so great as to materially affect life. Yet even under the most favorable circumstances it would seem as if the condition were one likely to render long life impossible through the general nutrition, brought about by the condition of the chylopoietic viscera.

The diagnosis is so difficult that, it seems to me, anyone would be exonerated from all reproach who was unable to make a diagnosis. When, however, such is made the practical interest consists in the prognosis and treatment. Let us take, for instance, the case which the doctor has reported and exhibited the specimen from tonight. The patient was a bookbinder, an occupation which if not laborious and not very difficult, yet required the very kind of exercise (arm movement) which would favor a too rapid flow of venous blood to the right auricle and produce disastrous results in the way I have pointed out.

Dr. JOHN A. ROBISON—Personally, I desire to thank Dr. Herrick for calling our attention to the fact that cases of disease of the right side of the heart are perhaps more frequent than we have been led formerly to believe. I think statistics will show that there have been placed on record about one hundred and thirty cases of tricuspid insufficiency. Dr. Herrick's records, I believe, include cases in which there have been found about one hundred and nineteen or one hundred and twenty cases of tricuspid stenosis, would it not?

Dr. HERRICK—Yes. There are about one hundred and thirty cases of this class now on record.

Dr. ROBISON—The recital of one of Dr. Herrick's cases brings to my mind a case which I had a few years ago in which the result was appalling, and in which I was somewhat at a loss to account for the rapid onset of the symptoms. An Englishwoman, 30 years of age, became pregnant. At about the sixth month of her pregnancy she developed alarming symptoms of valvular disease of the heart. There was a loud systolic murmur heard at the apex. The heart was considerably enlarged on both sides; then dropsy came on suddenly, disappeared, and she then had all the signs of rapid failure of the heart. Fortunately a miscarriage took place and she lived through it. As time went on a second pregnancy occurred. At about nearly the same period of pregnancy the same symptoms again manifested themselves, and the result this time was not the same as on the previous occasion. The symptoms became rapidly worse and the woman died. If we had been positive in regard to our diagnosis that it was not simply a case of mitral regurgitation, but perhaps one of tricuspid regurgitation as well, it is possible we might have advised that woman to avoid, if possible, the possibility of a second pregnancy, and her life might have been prolonged a considerable number of years. If we made diagnosis of disease of the right side of the heart more frequently than we do, we could prolong the lives of the unhappy victims.

Dr. A. M. CORWIN—In regard to the diagnosis of these cases, at first sight it seems strange that we have not more certain data; yet, as Dr. Herrick has said, cases of tricuspid stenosis are usually complicated with other lesions. We have several murmurs, not infrequently an aortic regurgitant murmur, dias-

tolic in time, and this is often heard most distinctly in the area in which we would expect to hear the presystolic murmur of tricuspid stenosis. This may be one of the reasons why an accurate diagnosis has seldom been made in these cases of tricuspid stenosis. We know from experience that where the heart beats over 90, and two murmurs occur, both diastolic, one in the first part of diastole, as is the case with the murmur of aortic regurgitation, and the other in the latter part of diastole—presystolic, it is not always an easy matter to make out their specific character.

With regard to the area of intensity of this murmur of tricuspid stenosis, over the lower part of the sternum, it suggests the question why we hear so frequently the murmur of aortic regurgitation loudest in this same area. Some authors, like Loomis, say that it is due to transmission down the sternum. The sternum undoubtedly transmits to its lower end loud sounds produced at its upper extremity. I think, however, those who have had much experience in examining the heart, know that while in many of these cases the diastolic murmur of aortic regurgitation is heard loudest at the lower part of the sternum, it may be in such instances heard with very little intensity at the upper or middle part of the sternum. In not a few instances, I have noticed that it is not only heard at the root of the appendix sterni, but along the costal arch for an inch and a half to the left. This I have explained with most satisfaction by the theory of its propagation along the diaphragm. As the murmur is produced in diastole the left ventricle is in close contact with the diaphragm at that time, and the murmur is therefore transmitted down to and along this to its attachment at the end of the sternum. The left heart being also enlarged in such cases, we can readily see why the transmission should take place in this manner. I have dwelt upon this point tonight because the murmur of tricuspid stenosis in question occurs in diastole and has its seat in the same region over the lower end of the sternum.

Dr. JAMES B. HERRICK—I will merely say a word or two in closing with regard to the prognosis. Leudet, whose name I have used frequently tonight, makes the statement that it is only by the complexus of symptoms and by the careful study of the entire condition of the patient that one can make the prognosis in these cases. And it seems to me also, that a study of this specimen, where we observe great hypertrophy of the auricle, will show how it is possible for some of these patients to live as long as they do. The statement is made by some writer with regard to this lesion, that auricular compensation is practically *nil*. But if we look at this postmortem specimen with the greatly hypertrophied auricular structure we can realize how there can be good auricular compensation.

With regard to the length of life in cardiac disease, particularly with the two lesions of insufficiency, or the two of stenosis, I recall that a few years ago I was called to see a patient, the father of a physician, and his history leading me to suspect cardiac disease, I started to place my ear to his chest, when he said, "Doctor, I have heart disease. Skoda told me so in Vienna thirty five years ago." At the time I made the examination he was about 67 years old, and had been told thirty-five years previously by Skoda that his heart was diseased. The lesion, as I remember, was mitral regurgitation with aortic regurgitation, bearing out the statement of Bacelli which was referred to by Dr. Babcock.

(*To be continued.*)

SELECTIONS.

The Medical Profession Under the Roman Empire.—A writer in the *Practitioner* has sketched some interesting views of medical practice in later Rome from Dr. R. Briau's "Archiatrie Romaine" and Dr. Vercutre's learned article, "La Médecine Publique dans l'Antiquité Grecque," published in the *Revue Archéologique*.

"Under Alexander Severus, and especially under Diocletian, physicians who had the good luck to bask in the sunshine of the Imperial favor could hope for almost any dignity and for any privilege. The Court physicians and their children were exempt from all taxes and public duties; they were placed in the highest ranks of Diocletian's hierarchy—among the Egregii, the Spectabiles, the Illustres, the Eminentissimi. The baronetcies and knighthoods half contemptuously flung to one or two members of the profession nowadays show poor indeed beside these titles and dignities. The highest offices in the state were not beyond the reach of the lucky doctor. Vindicianus, a medical practitioner, was Proconsul of Africa; and another member of the profession, Ausonious, father of the poet, was Prefect of Illyria. Nor were these isolated instances of the height to which medical men in those days might climb by Imperial favor. As regards public appointments held by medical practitioners, it is not till the time of the Empire that we find evidence of their being in the direct employment of the state as regular officials, with a definite place in the hierarchy of civil and military administration.

"Under Augustus there were medical officers to the circus, the amphitheater, the training school for gladiators, the public libraries, the Imperial Estate, the public gardens, etc. Both the army and the navy had regular medical services; the surgeons had a good position immediately after the senior officers. Their titles were—in the army *medicus militum, medicus cohortis, medicus castrensis;* and in the navy, *medicus ex triremi*, etc.

"In the provinces each town of any importance had several medical functionaries, who seem to have combined the duties of Poor Law medical officers and medical officers of health. They were paid out of a local rate to look after such of the inhabitants as needed their services, and generally to give advice as to sanitation. This was an old institution borrowed from the Greeks, but, though officially recognized, and even administered under state control, as far as the funds were concerned, in the provinces, it was not introduced into Rome itself till A.D. 368. In that year the Prefect Prætextatus issued a decree (*De Archiatris popularibus Urbis Romæ*) enacting that each of the fourteen districts of the city should have an *archiater* or chief medical officer. These officers are enjoined "honorably to tend the lesser folk rather than shamefully serve the rich" (*honeste obsequi tenuioribus malint quam turpiter servire divitibus*). They were allowed to accept the offerings of those in good health for services rendered, but not such as were promised for cure by persons in danger of death. On the death or resignation of one of these officers his successor was to be chosen, not by the favor of the great, nor by the legal authority, but by the votes of the other *archiatri populares*. It is hardly necessary to add, however, that the head of a despotic government could not long allow the right of election to any public appointment with a salary attached to it, to be independent of his control. Accordingly we soon find the Emperor interfering with the appointment of *archiatri*, and we find the refusal of the officers to recognize the appointment of a colleague by Imperial authority described as "a kind of sacrilege." By-and-by we hear of a *Præsul archiatrorum* placed over the others, and charged with the supervision of their official conduct.

"It is hardly necessary to add, however, that the head of the despotic government could not long allow the right of election to any public appointment, with a salary attached to it, to be independent of his control. Accordingly we soon find the Emperor interfering with the appointment of a colleague by Imperial authority described as a kind of sacrilege. By-and-by we hear of a Præsul archiatrorum placed over the others, and charged with the supervision of their official conduct.

"These old Roman practitioners knew little anatomy or physiology, and nothing of microbes; yet, no doubt, they were useful members of society. The superior scientific person of today looks on the past with a feeling of Pharisaic self-glorification, and the gibes of the Roman satirists might be taken to show that the medical practitioners of ancient Rome were not only impostors and quacks, but villains and profligates of the worst kind. It is impossible to receive this as a true picture of the whole profession. The evidence of witnesses like Cicero, Horace, and others—men of the world not likely to be imposed upon by ignorance or pretension—has already been cited. Another illustrious witness in favor of the doctors of Seneca,

who, after a glowing description of the devoted care which a good physician gives to his patient, says, 'Such an one is not merely a doctor, but a friend. Although I may pay his fees, I shall always remain his debtor; the debt of the heart remains undischarged,' *pretium operæ solvitur, animi debeter.* Evidently there were physicians worthy of the name, as well as grateful patients, in those days."

Etiology of Infectious Diseases.—After discussing at some length the etiology of infectious diseases, Surgeon-General Sternberg says in the *American Journal of the Medical Sciences* for December, 1896, that . . . it is surprising that any well-informed physician should entertain the vague and unscientific notions with reference to the epidemic prevalence of influenza which formerly passed current in attempts to explain epidemics of cholera, typhoid fever, typhus, etc., but in regard to the malarial parasite he considers it to be well established that it may be carried by currents of air to a considerable distance and gain access to the blood by way of the respiratory passages, but when applied to cholera or influenza it receives no support from facts or physical laws, for the epidemic may occur in a direction opposite to prevailing winds. . . . This brings us to speak of a classification based upon the mode or channel of infection. From this point we may have: *a*, traumatic infections; *b*, infection by contact (direct contagion); *c*, infection through ingesta; *d*, infection through the respiratory tract. Under the heading "infection by contact," *b*, we should have to include venereal diseases and contagious skin diseases. . . . . Another method of classification which presents certain advantages is one based upon the nature of the infectious agent. This would give us the following principal groups:

I. Diseases due to infection by vegetable parasites: *a*, schizomycetes (bacteria); *b*, hyphomycetes (microscopic fungi); *c*, blastomycetes (yeasts).

II. Diseases due to infection by animal parasites: *a*, protozoa; *b*, nematodes, *c*, trematodes; d, cestodes; *e*, acari. . . .

Finally, we may base our classification upon the special tissues or organs involved in the infectious process. From this point of view we have:

I. General blood-infections (septicemia), including malarial infection, relapsing fever, streptococcus infection, etc., in man; and anthrax, swine plague, cattle plague (rinderpest), Texas fever of cattle, etc., in the domestic animals.

II. Localized infections: *a*, of the integument and subcutaneous connective tissue, including scabies, the dermatophyti, erysipelas, furuncles, etc.; *b*, of mucous membranes, including diphtheria, influenza, glanders, bronchitis, rhinitis, conjunctivitis, otitis, gonorrhea, cystitis, enteritis (?), cholera Asiatica, cholera nostras, etc.; *c*, of serous membranes, including pleuritis, pericarditis, peritonitis, meningitis and synovitis; *d*, of glands, including typhoid fever, bubonic plague, parotitis, mastitis, adenitis, etc.; *e*, of the lungs, including pulmonary tuberculosis, croupous pneumonia, etc. It is evident that under several of the subdivisions the diseases mentioned would require a subheading to designate definitely the nature of the infectious process. Thus we would have, for example, to specify whether a peritonitis was tubercular or due to streptococcus infection or to some other known microörganism; an adenitis might be due to syphilitic or tubercular infection, or to one of the pus cocci; a conjunctivitis to gonococcus infection or to some other pathogenic microörganism, etc. It will be noted that, both in our classification on the nature of the infectious agent and in that based upon the special tissues or organs involved in the infectious process, we have not included the eruptive fevers. It is hardly necessary to say that this omission is due to the fact that as yet we have no positive knowledge to guide us in placing these infectious diseases in the classifications suggested, which are, therefore, necessarily incomplete.

PRACTICAL NOTES.

Permanent Success of Two New Methods of Treating Hernia.—The five children cured of congenital inguinal hernia by Prof. Lannelongue last July with local injections of one-tenth solution of chlorid of zinc (about 30 drops in all), as mentioned in this JOURNAL at the time, page 270, were exhibited at the French Surgical Congress in October, and the permanent success of the treatment announced. There have been no relapses, and coughing produces no disturbance. The inguinal ring is entirely obliterated, with an indurated plastron, continuous with the pubis. Notwithstanding the existence of this fibrous plastron, the elements of the cord and testes have remained normal. Poullet of Lyons also extolled the fine results obtained with his simple and effective autoplastic tendon method with which he cured over 83 cases last year. He obliterates the external ring by sewing it up without any ligature, catgut or silk, but with a piece of the patient's own fibrous tissue, still attached at the other end, which soon adapts itself to its new position and continues to grow as before. He first makes an incision over the ring, parallel to Poupart's ligament, 4 cm. in length, divides the stricture and separates the hernia from the cord. A wire thread is then passed through the stricture four or five times and the ends brought outside, through all the strata of the abdominal walls, thus separating the peritoneal cavity entirely from the field of operation. He enters through the external ring, which he never incises, consequently the operation is necessarily extra-abdominal and absolutely benign. The next step is an incision where the right anterior muscle of the thigh crosses over, 15 cm. from the anterior superior iliac spine. A ribbon of fiber, 1 cm. wide, is then detached from the inner surface of the tendon. Flexing the limb to relax the muscle, brings this tendon into prominence, and it is cut at the middle of the thigh. The finger insinuated under the sartorius creates an intercellular passage, and with a long pair of forceps, the tendon is drawn through it into the inguinal wound. With this tendon now the hernia is obliterated. With a large needle it is passed through the anterior wall of the canal, 2 centimeters outside of the external pillar, and then brought around the internal pillar of the internal ring. The 4 or 5 centimeters left are then run into a muscle, where they become ingrafted in a few days. The end is fastened with two fine wire stitches brought through to the skin and removed in a week. The results of the operation are very simple, the union by first intention taking place within eight days. In a few exceptional cases a serous discharge occurred for a little while, showing that part of the tendon had become necrosed, and had not grown in perfectly, but this did not interfere with the ultimate cure of the hernia.—*Bulletin Méd*, October 25.

The Best Treatment of Scabies.—Jullien describes in a recent article his surprise a few years ago when on a visit to Italy he saw in the consulting rooms patients stripped naked and being painted by the attendants with a brownish fluid from head to foot. He was informed that this method of treating scabies by painting the body with Peruvian balsam without friction, was the most effective. Since then he has adopted it in his own practice, and recommends it in high terms as simple and inexpensive, while much more effective than sulphur treatment, etc. He speaks with an experience of 300 hospital cases, besides those in his private practice. The odor is agreeable, and it kills the acarus and its eggs very rapidly. No preparation is necessary, the grease of the skin facilitating the action of the remedy. It is applied with a brush and gently rubbed over the entire surface of the body. At night is the best time, and a bath follows in the morning or later. He adds that he considers it "imperiously indicated" in all cases of extensive pyodermia; impetigo, ecthyma and boils, for persons with eczema, debility, cardiac troubles, albuminuria, certain cases of pregnancy, for

women in the menstrual period, and for every one who is unable to take baths for any reason, especially for infants with such delicate skins that any friction is followed by dermatitis or strophulus. It never causes any inconvenience, even when used for a long while.—*Province Med.* November 21.

Artificial Serum.—The *Gazette Méd. de Liège* of November 26, gives various formulas for artificial serum as follows: Surgical serum to use in post-operative peritoneal septicemia, in collapse, puerperal eclampsia, in severe typhus and uremia, in cholera and in infective diseases: Chlorid of sodium 7.50 grams; sterilized aqua dest. q. s. ad 1,000. Hayem's formula is: Sterilized water 1 liter; sodium sulphate 10 gr.; sodium chlorid 5 gr. (50 to 100 c.c.) Luton's formula: Sodium sulphate 10 gr.; crystallized sodium phosphate 5 gr.; aqua dest. 100 c.c. (5 to 25 c.c.) Cantani: Sodium chlorid 4 gr.; sodium carbonate 3 gr.; aq. dest. 1,000 gr. (30 to 40 c.c.) Samuel: Sodium chlorid 6 gr.; sodium carbonate 3 gr.; aq. dest. 1,000 gr. (From 2 to 500 c.c.) Schiess: Sodium chlorid 0.75 gr.; aq. dest. 1,000 gr.; sodium bicarbonate 0.50 gr. (For collapse in pneumonia, 10 c.c.) Vignesi: Sodium chlorid 50 gr.; water 100 gr. (20 to 30 c.c. in grave anemia.) Chéron: Sodium sulphate 8 gr.; sodium phosphate 4 gr.; sodium chlorid 2 gr.; phenic acid in flakes 1 gr.; sterilized water 100 gr. (5 to 10 c.c. every other day.) Huchard: Ster. water 150 gr.; phosphate 10 gr.; sodium sulphate 2.50 gr.; sodium chlorid 5 gr.; phenic acid in flakes 1.50 gr. (5 to 10 c.c.) De Renzi: Aq. dest. 1,000 gr.; pure iodin 1 gr.; potass. iodid 3 gr.; sodium chlorid 6 gr. (200 to 300 c.c. in pulmonary tuberculosis).

Beta-naphthol Inhibitory of Intestinal Fermentation.—Dr. David D. Stewart of Philadelphia, in the *Polyclinic*, takes up the subject of the treatment of cases wherein there is an excessive excretion of hydrochloric acid. He holds the opinion that it is very important for the relief of intestinal symptoms in these cases that full doses of alkalies be administered at the period of height of digestion of the meal, in order that the too acid gastric contents, in passing into the intestines, do not inhibit or entirely destroy the pancreatic ferments. To further prevent fermentative processes in the bowels he prescribes, as by far the most useful agent, beta-naphthol. This he gives in doses of 5 grains either in capsules combined with cannabis indica and such other drugs as may seem required, or he exhibits it in tincture of ginger, a dram of which dissolves the required dose. To this is added one to two drops of oil of cajeput. The last method of use, although not the most elegant, he regards as the most efficient. It is taken in a small quantity of water and followed by a draught of a few ounces. The naphthol which is thus first dissolved in ginger, on being added to water, in process of taking becomes reprecipitated in very minute crystals, less irritating than when prescribed in the form of powder and administered in wafer or capsule.

New Method of Radical Cure of Inguinal Hernia without Sunken Threads.—An article in the *Semaine Méd.* of November 11, signed by Professors Duplay and Cazin, illustrates a way by which the hernial sac is tied without threads which frequently produce trouble later. The sac is first opened and explored with the fingers, all adherences detached, and a portion of the omentum resected if necessary. The sac is then completely dissected, and an assistant draws out the base with a pair of forceps as far and as long as possible, with that portion of the peritoneum normally situated 2 to 3 centimeters above the internal inguinal ring. The operator then seizes the end with another pair of forceps and draws it around and through to make a knot, as high up as possible. The ends remaining above the knot are then split and one end is drawn around and through in the same way, to make another knot, or passed through a slit in the other half, and this is repeated as often as the length of the sac will allow. In one case the sac was so short that it was split in four pieces and the four ends tied in knots two by two. A strong fastening is thus made without the introduction of any foreign substance, remarkably simple and perfect in its results. When the traction ceases it sinks out of sight immediately, as in the classic operation. It was always found that the highest part of the knot remained 2 or 3 centimeters above the internal inguinal ring. The operation is then completed in the usual manner. If the sac is too thick to be tied in this way, it can be split and knots made in each half separately.

Vaccinia Remittens.—Mr. C. F. Sutton of Cheshire, in London *Lancet*, October 24, reports an anomalous case of vaccination as follows: "In March last I vaccinated a child with calf lymph, and on the eighth day it had taken exceedingly well without the least sign of inflammation. The vaccination ran its usual course and the scabs having come off left four perfectly healed marks, but to my astonishment a month afterward the same places began to rise again and resembled in every respect a newly vaccinated arm. It ran the usual course again, becoming quite well. The same thing occurred again early in June and late in July. Much to my surprise, I was called to see the child on October 5 last, and I then found the arm again taking precisely as it did in the first instance and running the usual course, and any one not knowing the circumstances of the case could not have seen any difference between it and one freshly vaccinated. The child is perfectly healthy and has suffered no inconvenience beyond the slight irritation due to vaccination. I called the attention of the vaccination inspector to the case in September last and he informed me he had never either seen or heard of such a case."

Operation and Cure of a Case of Addison's Disease.—A malignant retro-peritoneal tumor was diagnosed in the case of a woman presenting all the symptoms of Addison's disease. When removed it was found to be a suprarenal capsule in a state of tuberculous degeneration. All the various symptoms disappeared completely after the operation, and the patient has enjoyed fine health ever since. There were no organic lesions except this tumor and an old tuberculous focus in the lung. It must be evident therefore that the condition of the capsule was responsible for the development of the disease. Hence the removal of one or both capsules in Addison's disease seems to be indicated. The operation is not difficult as a tubercular capsule is more easily separated from neighboring organs than a sound one.—Oesterreich in the *Ztsch. f. Klin. Med.*, No. 2. *Bulletin Méd.*, November 15.

Tannosal.—Kestner has administered this preparation of creosote and tannic acid (3 to 2) to seventy-five patients this year and reports the benefits equal to those derived from other creosote preparations, while there were no inconveniences from its use, except in three cases of intestinal tuberculosis when it produced colic. It is better tolerated by the digestive apparatus than any other creosote preparation and produces an intensive diminution of the bronchial secretions, fully equalling, if not surpassing, terpin in this respect, while it increases the appetite and weight. Its effect was more marked in children than in adults. His dose was three tablespoons a day of the aqueous solution (never more than six) and for children as many teaspoons as they were years old.—*Therap. Woch.*, November 22.

Hysteric Deafness.—Before commencing a more serious course of treatment, Cipriani advises treatment by suggestion when any unusual case of deafness presents itself, with a record of intermittency. He describes a case of this kind in which he secured permanent cure by simple suggestion, although every indication pointed to rheumatic deafness from exposure, and the patient, a healthy farmer of 44, seemed absolutely free from neurotic tendencies.—*Gazzetta degli Osp. e delle Clin.*, November 22.

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SATURDAY, DECEMBER 26, 1896.

EARLY AMERICAN PHARMACOPEIAS AND THEIR AUTHORS.

The recent International Pharmaceutic Congress at Prague dealt with the history of pharmacopeias but devoted almost no attention to the evolution of pharmacy in the United States. The first attempt at a pharmacopeia in the United States resulted at Lillitz, Pa., from the endeavors of Dr. JAMES TILTON of Delaware to secure an official standard as a check on the rapacity of the contractors supplying Washington's army. Dr. TILTON was the first president of the Delaware State society organized in 1789. He was graduated from the University of Pennsylvania in 1771. In 1777 while in charge of the General Military Hospital at Princeton he exposed the "boodleism" and brutality which naturally resulted from laymen having charge of the medical department of Washington's army. Through Dr. TILTON the service was reformed. Relatively inexpensive, readily ventilated, log hospitals took the place of the old mansions previously used. The wounded did not suffer so much from unnecessary travel. Mortality decreased and the health of the convalescent was much improved. Dr. TILTON, like most physicians of the time, took an active part in modeling the statesmanlike measures characteristic of the American Revolution. He was several times a member of Congress. During the war of 1812 he was made Surgeon-General U. S. A. He was a man of great executive ability and an excellent sanitarian. He died in 1822 at the age of 77. Among his contributions to medical literature was one advocating the sea-air in cholera infantum.

The first edition of Dr. TILTON'S pharmacopeia appeared in 1778. It was based on the Edinburgh Pharmacopeia and went through a second edition in 1781, Dr. WILLIAM BROWN editing it.

The next pharmacopeia in the United States was issued by the Massachusetts Medical Society. At the Oct. 3, 1805, meeting Drs. JAMES JACKSON and JOHN C. WARREN were appointed a committee to prepare a pharmacopeia, which was adopted June 5, 1807, and issued from the press Dec. 17, 1807. Various other State and local medical societies adopted different official standards, but the need of a common standard was widely felt. In 1815 the physicians and surgeons of the New York Hospital had prepared by Drs. S. L. MITCHELL and VALENTINE SEAMAN, a pharmacopeia for that institution. This for several years was of more than local authority (U. S. Pharmacopeia, 1890).

In January 1817, Dr. LYMAN SPALDING of New York City submitted to the New York County Medical Society a project for the formation of a National pharmacopeia. Dr. SPALDING'S plan was as follows: The United States to be divided into four districts, northern, middle, southern and western; the New England States to form the northern district; New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia, the middle district; and the States south and west of these borders to constitute the other two districts.

The plan provided that a convention should be called in each of these districts, to be composed of delegates from all the medical societies and schools situated within each of them. Each district convention was to compile a pharmacopeia, and appoint delegates to a General Convention to be held in Washington. To this General Convention the four district pharmacopeias should be taken and from the material thus accummulated a National Pharmacopeia should be compiled.

Dr. SPALDING'S plan was approved by the committee to which it was referred and subsequently through the agency of the New York State Medical Society was carried into effect. This society issued circulars requesting the coöperation of the several incorporated State Medical Societies, the several incorporated colleges of physicians and surgeons or medical schools or such medical bodies as constituted a faculty in an incorporated university or college in the United States; and in any State or Territory in which there was no incorporated medical society, college or school, voluntary associations or physicians and surgeons were invited to assist in the undertaking.

The following organizations approved the plan of forming a National Pharmacopeia and appointed delegates to district conventions: Massachusetts Medical

Society, June 2, 1818; New York College of Physicians and Surgeons, June 25, 1818; Maryland Medical and Chirurgical Faculty, June, 1818; Rhode Island Medical Society, September, 1818; Medical Society of the District of Columbia, Oct. 5, 1818; Connecticut Medical Society, Oct. 15, 1818; Yale College, Oct. 28, 1818; Vermont Medical Society, October, 1818; Board of Physicians and Surgeons of the First Medical District of the State of Indiana, November 3, 1818; College of Physicians and Surgeons of the Western District of the State of New York, January, 1819; College of Physicians of Philadelphia, February 2, 1819; Medical Faculty of Brown University, March 15, 1819; Medical School at Lexington, Ky., April, 1819; New Hampshire Medical Society, May 5, 1819; New Jersey Medical Society, May 11, 1818; Delaware Medical Society, May, 1819; Georgia Medical Society, May, 1819.

The Medical College of Ohio and the Medical Society of New Orleans approved the formation of a National Pharmacopeia but did not appoint delegates. The district convention for the New England States was held in Boston June 1, 1819, and a district pharmacopeia was adopted. The district convention of the Middle States was held in Philadelphia June 1, 1819. Two outlines of pharmacopeias submitted by the delegates from New York and Philadelphia were by a committee there chosen, formed into one, which was adopted as the pharmacopeia of the middle district.

There were no conventions held in the southern and western districts, but measures were taken by those concerned to secure a representation of the southern district in the General Convention at Washington. The General Convention for the formation of a National Pharmacopeia assembled in the Capitol at Washington January 1, 1820, and elected SAMUEL L. MITCHELL, M.D., President, and THOMAS T. HOWSON, M.D., Secretary.

The two pharmacopeias prepared in the northern and middle districts were submitted to examination, compared in detail, and their contents, with such additions as were thought necessary, consolidated into one work, which after full revision was adopted by the General Convention and ordered published by a committee, of which Dr. LYMAN SPALDING was chairman. It was published in Boston December 15, 1820, in Latin and English. A second edition appeared in 1828.

Before adjourning, the General Convention of 1820 made arrangements for the future revision of the work. It instructed its president to issue, January 1, 1828, writs of election for the several incorporated State medical societies and incorporated medical colleges and schools in the northern district requiring them to ballot for three delegates to a General Convention to be held at Washington on Jan. 1, 1830, for the purpose of revising the American Pharmacopeia; and that these several institutions be requested to forward to the president on or before April 1, 1829, the names of three persons thus designated by ballot, and the president of the convention was requested on the said day to assort and count the said vote and to notify the three persons who should have the greatest number of votes of their election; and in case there should not be three persons who had a greater number of votes than others, then the said president was desired to put a ballot into a box for each of those persons who had an equal number of votes and draw therefrom such number of ballots as should make the number of delegates three, and notify as before directed. This resolution was to apply in like manner to the middle, southern and western districts. There were to be three delegates from each of the four districts, the convention thus to consist of twelve delegates.

Excellent as were these arrangements for the convention of 1830, a serious misunderstanding occurred, with the result that there were two pharmacopeias published, one in New York and one in Philadelphia. The convention of 1840, however, was practically unanimous. The later conventions have been held along the lines indicated in that convention.

Among the pharmaceutic developments along the same line as the pharmacopeia were the dispensatories. The most interesting of these are the American New Dispensatory and the American Dispensatory. The American New Dispensatory, compiled by Dr. JAMES THACHER, was endorsed in 1809 by a committee of the Massachusetts Medical Society, composed of Drs. JOHN WARREN, AARON DEXTER and JOSIAH BARTLETT. The last was one of the medical signers of the Declaration of Independence. This dispensatory was based on the Massachusetts Pharmacopeia. The American Dispensatory, based on the Edinburgh Dispensatory, was issued by Dr. JOHN REDMAN COXE of the University of Pennsylvania. It summarized all contemporary dispensatories of the continent of Europe.

The matter of most interest in the Massachusetts Pharmacopeia and these Dispensatories, is materia medica. Most articles on which much stress is laid by the sectarians of today are found enumerated therein. The materia medica includes aconite, æsculus, apium, arctium, bryonia, asclepias, blessed thistle, juglans cinerea, lobelia, rhus toxicodendron, xanthoxylum, rhododendron, actæa spicata, geranium maculatum, hamamelis virginiana, iris, podophyllum, scutellaria, and many other remedies which are claimed as discoveries of the sectarians. These early American pharmacologic investigators seem to have been very keen sighted. The recent onslaughts on sarsaparilla appear eighty years previous in the Dispensatories to which reference has been made.

THACHER, for example, observes that sarsaparilla is a very inert, mucilaginous substance. He gives an account of Dr. CURRIE'S treatment of typhoid fever with what is practically the cold water method of BRAND. CURRIE adopted this method a little over a hundred years prior to BRAND. The method was independently used in the New York Hospital by Drs. BARD and D. HOSACK in 1793. THACHER gives the following exceedingly interesting accounts of thermometry at a time when the procedure was not supposed to be employed by practitioners:

"What thanks would not be due to him who should teach with certainty when to employ and when to avoid blood-letting, and especially should he give so accurate a guide as the thermometer and the feelings of the patient as to heat when confirming each other?

"The thermometer indeed can not always be used by the country physician to whom we shall soon suggest a substitute; but to others, who can more easily obtain this useful assistant we address the following information.

"JOHN HUNTER in the London Philosophical Transactions for 1778 (see also those for 1779) describes one of his own invention and of Mr. RAMSDEN'S workmanship which was short, slender and with so small a bulb that he could put the whole into a peacock's quill, even including the scale, which was movable and of transparent ivory, being in the form of a hollow tube and nowhere touching the bulb. The results of this thermometer differed from those of others used by JOHN HUNTER and even from his own expectations. It was this sort of thermometer which Dr. CURRIE employed with his patients, taking care to make the stem bend backward in order to admit of his standing behind the sick, to avoid infection from their breath. Dr. CURRIE recommends as a further improvement a gauge like that used by Mr. SIX in his thermometers made upon the plan of those invented by Lord C. CAVENDISH (see London Philosophical Transactions for 1782 and 1757). But a thermometer with spirits of wine (which sufficiently corresponds with one of mercury in the high temperature here in question) would probably be visible enough to answer every purpose were the spirits as usual colored. It does not appear why excessive diminutiveness is so necessary a quality in mere medical thermometers.

"We have hinted that country practitioners must often be content, and may do sufficiently well, without thermometers, and especially in these parts of the United States where thermometers are so seldom found corresponding with each other, and where even if good they are with difficulty replaced in case of accident. The uses of the thermometer in Dr. CURRIE'S system of practice were two; one to show the heat of the patient and the other the temperature of the water to be applied to him.

"Let us begin with the latter subject. It is known to every practitioner that boiling water is always of the same heat in the same state of the atmosphere. Next it will soon be shown that water can always easily be found at hand at certain other known degrees of temperature. Lastly, rules may be given for producing any intermediate temperature between that of boiling water and water of any other known temperature, merely by mixing in certain proportions and with certain precautions. We shall now show that water may generally be found of several temperatures which are easily ascertained without the aid of thermometers. In winter, water which has remained a certain time filled with ice or pounded snow, after it is poured off, will stand at the freezing point or at 32 degrees of Fahrenheit's thermometer. Water will also stand at the freezing point when taken from underneath a surface of thick ice formed upon it in winter in a vessel of moderate size. The average temperature of the air throughout the year may be known for any place and this temperature is one and the same with that of the springs of the place when first issuing from the ground and also of the earth of the place at a few feet below the surface. The average temperature of each month also may easily be known for any place, and when known it will commonly nearly mark the temperature of the water accidentally found in any considerable vessel placed under shelter from the wind and sun but exposed to the open air, especially upon making certain obvious allowances.

"Enough then has been said as to the fixed points of heat at which water may be found and the methods by which it may be tempered by being mixed in different proportions at different temperatures for the purpose of bathing, aspersing or moistening the bodies of different patients according to their respective cases. Happily very great nicety is not found to be requisite, and perhaps the guess of the practitioner will always abundantly suffice. In this case what has been said on these subjects will not be lost, since it will find its place with those attentive to meteorology and other branches of natural philosophy.

"As to calculating the patient's heat without help from the thermometer, in general we may depend on the patient's feelings and rapidity of the pulse, the precedence of the cold stage of fever, the color of the skin, the freedom from perspiration, the fullness of the face and the marks of universal heat to the touch of the observer. That the practitioner may not be misled by the remains of heat which the bedclothes may have kept in the patient from a preceding hot fire, let the bedclothes be thinned with judgment and for a short time, if the patient still remain hot, he will offer a new criterion as to his temperature.

"If other rules are wanting the following are some which present themselves: Take a short tube of glass exceedingly thin, and with a very small bore, having one end open and the other closed. Having first heated it gradually by placing it outside in heated water, plunge its open mouth into a small quantity of spirits colored with cochineal, or of aquafortis made blue by vitriol or copper, or if quicksilver is at hand, put it into a little quicksilver. As the air cools in the tube, fluid will rise into it, and when a very short column (amounting only to a drop or two) has been taken up, we have an instrument suited to our purpose. A cork may be placed in the open end when this instrument is not in use to prevent dirt entering or the evaporation of the spirits or water; but the cork must be carefully withdrawn to preserve the connection with the atmosphere, when the instrument is employed. Let the practitioner place it during some time under his arm pit when at the sick bed, and marking the spot then occupied by the column of fluid, let him wipe the instrument and place it under the arm pit of his patient. If the patient's heat is greater than his own, the air behind the column of fluid confined by the closed end of the tube, will now be most rarefied, and drive the fluid farther out than with himself; if the contrary, the reverse will happen. This instrument must at some one time be compared with the thermometer merely to show how its scale of variation agrees with that of the thermometer, unless this can be guessed at by other methods. But the degree in which an instrument of this sort will be affected by the changes in the weight of the atmosphere (for it is a species of barometer) render it necessary that the comparison of it with the heat of a healthy person should always take place. An object to be further attended to is that the patient's heat be not only greater than natural, but at a high pitch even for fever heat.

"Perhaps chemists may invent some compositions which by their melting or effervescence may indicate fixed degrees of heat, which may be contrived to serve as standards for the heat of fever.

"With respect to the standard heat of the human subject, taken internally in a state of health, it varies with age, constitution, exercise, fulness from meals, and other circumstances independent of disease. The usual average temperature is perhaps at 97 degrees, but eating, for example, increases it one or more degrees. In disease, according to Dr. CURRIE'S observation, it sometimes in extraordinary cases sinks as low as 92 degrees, and sometimes in cases equally extraordinary it rises to 105 degrees. Repeated doses of the purple foxglove have reduced the heat to 89 degrees and the pulse to 32 in the minute."

These directions, it must be remembered, were written long ere clinical thermometers became common. They indicate, as has been repeatedly pointed out in the JOURNAL, that all medical discoveries take a long time to become established. The Dispensatory of Dr. COXE was more extended as to pharmacy and chemistry than that of Dr. THACHER. It gives all the synonyms of the coexisting dispensatories of Holland, Denmark, France, Germany, Italy, Portugal, Poland, Russia, Spain and Sweden, and contained an extended posologic and prosodial table.

On the whole, pharmacy at the beginning of this century occupied the place it deserves to occupy in American medicine, and the Pharmacopeia had a respect which does not obtain today, but which it should have, for the sake of uniformity if for nothing else.

THE AMBULANCE SHIP.

Even non-nautical readers of sea tales and naval history, up to quite a recent date, had become tolerably familiar with the various classes of the white-winged creations of the naval architect. They knew that a sloop-of-war had three masts and a brig only two; that a frigate had two gun-decks and a line-of-battle ship three or four; but their knowledge avails them little in reading of the battle ships, armored cruisers, commerce destroyers, coast defenders, monitors, torpedo boats and torpedo catchers that constitute the navies of the present decade. Today, another craft has been baptised—the *ambulance ship*—even before her keel has been laid, though it is by no means certain that she will have a keel.

The Surgeon-General of the Navy, more than a year ago, had outlined the functions of a contemplated ambulance ship, and in his annual report of this year, which has just been published, he reverts to the subject and urges with greater earnestness and with the countenance and support of the Navy Department, the importance of a vessel, whose designation indicates her special office—literally a floating ambulance, which like the vehicle on shore is to gather the sick and wounded from the site of conflict and conduct them to a place of safety. The ambulance ship must needs also be a temporary hospital ship, equipped with appliances and apparatus that may be required for even capital operations, but precisely how she is to be rigged, outfitted, equipped, officered and manned is yet a matter of future development. "Considerable attention," says the Surgeon-General, "is now being paid to the construction of such vessels abroad, and it is universally conceded that they should be designed and built for this particular duty, and considered an essential part of the fleet of war." "These relief ships should be fast steamers, fitted with comfortable beds, and equipped and conducted by the officers of the medical staff and men of the hospital corps, who have been thoroughly trained in time of peace in the duties of nursing and caring for the wounded." "The plans suggested for such vessels provide large wards for officers and men on the spar deck for treatment of serious cases, and additional wards, affording ample space, on the main deck and lower deck. Natural ventilation is assisted 'by a steam spray extracting apparatus, as well as by a steam fan blast that pumps in an abundant supply of fresh air.'"

Hospital ships have existed for years. The U. S. Hospital Ship *Idaho* was established at Nagasaki, Japan, in 1868. At the same time the British Navy had the Hospital Ship *Actæon* stationed at Shanghai and the *Princess Charlotte*, an old four-decker, at Hong Kong. This class of vessels has not, however, been considered satisfactory or desirable by our own medical officers, except in insalubrious or inaccessible localities, where it was absolutely impossible to properly care for the sick and wounded on shore. Other things being equal, it is beyond question that a hospital on shore is better than one afloat. There is healing balm in the mere touch of the earth, in the scent of vegetation, the odor of the flowers; this, without contesting the marvelous recuperative effect of ocean therapy in chronic disorders, nervous exhaustion, tardy convalescence, etc., as shown after long sea voyages over smooth seas, in temperate climates, on board spacious, well-ventilated, dry, clean ships. Hospital ships of this sort would be of the utmost advantage, and it is to be regretted that they exist only as the dream of enthusiasts.

The stationary Hospital Ship for general purposes is only of value in malarial localities, where it is unsafe to remain on shore especially after sundown; but a hospital ship, which can accompany fleets or squadrons and be anchored in a safe harbor, with close communication with the fleet or squadron, from the several vessels of which their invalids can be quickly transferred, is undoubtedly "an essential part of the fleet of war;" and it is just here that the fast steaming ambulance ship comes into service as the feeder for such a hospital ship, primarily, or for the station hospital ashore when the latter is accessible. Such a ship must be able to approach near enough during an engagement to receive the wounded, care for them temporarily and transport them to a place of safety and be provided with steam hospital launches to run alongside combatant vessels in action, when the risk of exposure of the larger vessel would be too great. With all this, however, the need for proper hospital establishments on board the individual vessels will still exist. The speedy removal of every serious or protracted case of illness, such as fever, phthisis and chronic dysentery will relieve the local requirements; but, however, admirable the provisions for the expeditious transfer of the wounded may be in time of battle or in squadron evolutions, there must be no relaxation of the demand for proper quarters for the sick and disabled on board each vessel, on which the present Surgeon-General has positively and persistently insisted. The "Sick-bay" or *Ship's Hospital*, as it is more appropriately termed, should be located in that part of the vessel, where air-space, ventilation, absence of disturbing causes and isolation can be best secured. It should never be where, it has been heretofore uniformly established, in the restricted narrow space on the berth-deck, at the extreme bow, directly under the chain cables and over the paint-room. The dispensary, so-called, ought rather to be the medical office, with a cabinet dispensary and surgical outfit, but primarily an office where men can be examined by the medical officers, without interruption or exposure. The large proportion of the sick who are not bed-ridden, after treatment in this office are better on deck in the open air, the Geneva Cross

brassard identifying them as well to prevent their being called upon for duty as their interference with the ship's routine work. For bed-ridden patients, a limited bulk-headed hospital of rigid dimensions is less desirable than one which can be contracted or enlarged by screening off a designated space of the gun-deck by canvas partitions attached to brass sockets in the deck below and by hooks to the beams over-head, permitting, when there are no sick requiring isolation, the whole deck to be thrown open for the general ship's purposes. There must be, however, a positive provision in the naval regulations for the assignment to hospital purposes, of an indicated portion of the deck, shown on the ship's plans and conspicuously marked by brass sockets on the deck, whenever, in the opinion of the medical officer this shall be necessary; otherwise, as occurred some years ago, when the medical member of the Naval Board of Inspection recommended that one of the two bulk-headed hospitals of a newly built vessel might be reserved for this very purpose, the part of his recommendation abandoning one of the bulk-headed hospitals was adopted, and the apartment surrendered occupied as a gunnery store-room.

A large, commodious, well-lighted apartment, as far aft as possible on a gun-deck, where it will be away from coal chutes, dynamos, steam capstans and the like, should be assigned to the exclusive use of the medical department for the examination of the sick, inspection of recruits, performance of operations, administration of remedies, preparation of official records and care of instruments and apparatus, with bathing facilities and cots for a limited number of patients; but we doubt whether the Surgeon-General of the Navy is ever taken into council in the building of a vessel as to the proper location and dimensions of its medical establishment, any more than he is invited to say what shall be the cubic air-space for the commanding and other officers or the men of the crew. It is by no means certain that he has any voice as to the nature and quantity of the food supply, or its preparation and distribution, or whether he is ever consulted as to the arrangement of meals and the hours of labor; yet all this is legitimately the duty of the health officer of the community, which is the primary function of his office as preserver of the efficiency of the human element of the fighting machine.

It is to be hoped that the energetic incumbent of the office of Chief of the Bureau of Medicine and Surgery of the Navy Department, Dr. TRYON, may not only successfully accomplish his proposed construction of an ambulance ship for every squadron, but succeed in locating and equipping the hospital on board every naval vessel in commission as thoroughly as he has the naval hospitals on shore. He has replaced the disreputable market wagons heretofore used for the transportation of the sick by modern ambulances, and has instituted operating rooms that are not surpassed by any in the world. There is no fault to be found with the supply-table except on the score of too great liberality. All this done, hospital ships constructed and ships' hospitals perfected, there will still remain the subject of a naval hospital corps, to make the Medical Department of the Navy of the United States, on shore and afloat, all that it should be in *matériel:* legislation by Congress can alone make it what it ought to be in *personnel.*

THE OBSTETRIC SIDE OF HYSTEROPEXY.

The current literature of the last three years has been teeming with reports of complications in pregnancy and labor subsequent to, and directly traceable to, a previous operation of ventral or vaginal fixation of the uterus for retrodisplacement or prolapse of that organ. So frequently have these unfortunate results occurred, especially after vagino-fixation, that the latter operation has already been practically abandoned, even by its originators, and the most earnest advocates of the ventral operation have modified their technique in various ways in an endeavor to avoid as far as possible the difficulties alluded to. The variety and comparative frequency of the complications after hysteropexy have recently been presented by DORLAND of Philadelphia, in a comprehensive paper on the subject, and the deductions that he has drawn from his investigations are well worthy of a few moments' consideration.

In the first place, he ascribes all of the ill results noted not to the operation *per se*, which, he rightly claims, is the most suitable cure for the uterine displacements in question, but to some defects in the technique. The truth of this statement is amply proved by a comparison of the results obtained by the German and American operators. In the hands of the former the operation becomes no longer that which was intended by its originators—namely, a true *suspension* of the uterus, whereby that organ is freely mobile—but an absolute *fixation* of the uterus to the anterior abdominal wall, rendering its growth and development in a subsequent gestation either an utter impossibility or a matter of extreme difficulty. The American gynecologists, on the other hand, who have studied the problem most assiduously, have concluded that the suspension is best accomplished by including in the grasp of the sutures—which should not be placed on the posterior surface of the uterus, but upon the fundus just posterior to the transverse median line—the peritoneal surfaces only of the uterus and abdominal wall. All scarification of the apposed surfaces is carefully avoided, and the uterus remains practically free to move in any direction. The great majority of the complications reported have followed the German method of operating, thereby demon-

strating the undoubted superiority of the method practiced in this country.

Another defect in the technique of the operation is to be found in an improper implantation of the sutures into the abdominal wall. If they be placed too far above the symphysis pubis, the uterus is lifted out of the pelvic cavity and becomes an abdomino-pelvic organ, or the entire structure, cervix included, may lie above the pelvic brim; while if the sutures be inserted too low on the anterior abdominal parietes there results a sharp anteflexion of the uterus together with an anteversion, the cervix being carried far back and up toward the promontory of the sacrum, where it may be entirely out of reach. In addition to this unfortunate state of things, the tendency of the fundus uteri to return to its normal position results in serious traction upon the bladder with various functional disorders of that viscus.

The obstetric sequels of the operation as demonstrated by DORLAND'S researches are intensely interesting. Transverse presentations of the fetus occur with an astonishing frequency, such being noted in 3.35 per cent. of the reported cases. This, as stated by the author, is due to the inability of the uterus to develop in its longitudinal axis as a direct result of the fixation, a compensatory growth occurring in the transverse axis, which thereby becomes the longer and most readily accommodates the growing embryo and fetus. Painful traction upon the site of fixation; a marked aggravation of the normal nausea and vomiting of pregnancy; improper placental implantations (placenta previa); inflammatory affections of the deciduæ and other membranes; and varying degrees of uterine inertia, rendering delivery by nature difficult or an impossiblity or favoring the occurrence of postpartum hemorrhage and puerperal sepsis, are other anomalies recorded after the operation. In over half of the cases, or more accurately in 62.01 per cent. of the pregnancies, some abnormality was noted, either in gestation, in labor, or in both. Version was performed nine times; forceps were employed eleven times; in four instances Cæsarean section has been performed; retention of the placenta occurred three times; the fetal mortality was 17.87 per cent. and the maternal mortality 1.11 per cent. These statements are quite sufficient to indicate the truly serious results that may follow the apparently harmless operation of abdominal hysteropexy, and the question now arises, Are we justified in performing that operation in young women, or in those in whom the possible occurrence of pregnancy may exist? It may be that a strict observance of the proper technique as already suggested, may largely do away with subsequent complications, but this has not been positively demonstrated as yet.

Let us have a Department of Public Health!

THE MILWAUKEE-CHICAGO DIPLOMA MILL.

Many readers of the JOURNAL have been active in sending to the editor copies of the circulars of the Wisconsin Eclectic Medical College, an institution to which we have several times referred in no complimentary terms.

The first step taken by the JOURNAL was to place all the information in its possession in the hands of the Attorney General of the State of Wisconsin, with a view to having the charter annulled. That officer, keenly alive to the disgrace being placed upon his State by this institution, very promptly took steps for the annulling of the charter, a petition for which was printed in full in the JOURNAL, June 20, 1896.

Within the last month we have been in communication with the postoffice authorities of Chicago. Postmaster HESING very promptly referred the papers to the postoffice inspector, Captain STEWART, who has been after the diploma mill for fraudulent use of the United States mails.

A reporter for the *Chronicle* of Chicago undertook the hunt of "Dr." FRED RUTLAND, whose office purported to be at 1001 West Congress St., in Chicago. He found a small two-story brick house, without a sign on the door, and on ringing the bell his ring was answered by a Chinaman, who said that no one was admitted, that Dr. RUTLAND lived in Milwaukee, and the mail of the "college" was sent there. The *Chronicle* man says:

The Wisconsin Eclectic Medical College has on its printed matter no reference to its Milwaukee address, although its office is by charter compulsorily in Milwaukee. Until recently it did business there, but since August the business has been transacted from Chicago. The circular addressed to Dr. Brown was sent to him because his name was starred in the *Medical and Surgical Register*, a publication of R. L. Polk & Co., the directory printers. Referring to that publication the Wisconsin Eclectic Medical College is found to have headquarters at the home of Dr. Rutland at 1809 Fond du Lac Avenue, Milwaukee. It is said to have been organized in 1884 and to have graduated its first class this year. It is said to have three professors, three lecturers and two demonstrators. Referring to another portion of the book, Dr. Fred Rutland, the president of the college, is found to be a graduate of the Illinois Health University. This institution, it is stated in another part of the *Register*, issues diplomas that are not recognized by the Illinois State Board of Health. Dr. Rutland's graduation from that institution was quite recent. When he obtained his degrees of S.D. and Ph.D. that appear in the circulars is not told by the *Register*. It is further stated in the *Register* that he was surgeon and medical officer of the Wagga Wagga district of mounted police, New South Wales, and that he is a member of the National Union Medical Society of Chicago. As to his associates, Dr. Podmore and Dr. A. Neve Rutland, the *Medical Register* is silent.

Manager Denser of R. L. Polk & Co, said that they had had inquiries about the Wisconsin Eclectic Medical College and that several of the queries had come from insurance companies that had applications for positions as examiners from holders of the college's diplomas.

Among the JOURNAL'S esteemed correspondents we are happy to number Dr. PAUL R. BROWN, Surgeon of the United States Army, now stationed at Fort Hamilton, who sends a letter he has received, together with his reply, which we herewith reproduce:

CHICAGO, November 16, 1896.

Dr. Paul R. Brown, Fort Hamilton, N. Y.—Dear Doctor: We notice your name in a medical and surgical directory, but

with a * appended. This usually means (although not necessarily so) that the person so designated is not a graduate of a medical school and has no diploma. If, however, it should be that you are a graduate and have a regular diploma then we can but tender our most sincere apologies for troubling you on the matter. But, on the other hand, if you are not a graduate and have no regular diploma then the perusal of the inclosed prospectus can not fail to be of the most primary importance and interest to you. We would also desire to draw attention to the fact that to practicing physicians our fees are much reduced from the regular rate. To this class our fees are $35, all inclusive.

As proof of our legal standing and right to confer the degree of M.D. we can supply certified copies of our charter at 25 cents each, simply covering the cost of certifying officer's fee.

Trusting soon to hear from you and standing ready to answer any or all questions you may wish to submit, we are, yours, very sincerely.

WISCONSIN ECLECTIC MEDICAL COLLEGE,
FRED RUTLAND, PH.D., M.D.

To the circular Dr. BROWN replied as follows:

FORT HAMILTON, N. Y., November 23, 1896.

Fred Rutland, Chicago, Ill., Sir: I have never known nor heard of an instance of more unadulterated impudence than your action in daring to address a graduate in medicine of twenty-nine years' standing and a surgeon in the United States army for the last twenty-three years, and offering to sell him one of the products of your diploma manufactory.

As advertising seems to be what you most desire I shall take great pleasure in forwarding your communication to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, published in Chicago, which will undoubtedly advertise the institution with which you are connected in a manner well adapted to show up the dirty, mercenary business it is engaged in. With the most profound contempt for you and yours, I remain, your obedient servant,

PAUL R. BROWN, M.D.
Major and Surgeon, United States Army.

The worst feature of the matter is that this circular by RUTLAND, which has been sent broadcast all over the United States, from Maine to Texas, has been sent in thousands of cases to prescribing druggists, many of whom have been gulled into purchasing the alleged diplomas.

A recent issue of the Detroit *Journal* states that there are about a dozen "graduates" of this diploma mill in that city, and from all accounts it would seem that Philadelphia, some years ago the home of the notorious Buchanan diploma mill, will now have to yield the unenviable precedence for number of this sort of graduates to the Milwaukee-Chicago concern. There, however, we believe the parallel ceases, as Pennsylvania sent BUCHANAN to prison, whereas, unless the Federal Government deals with the interesting "Dr." RUTLAND, he is likely to suffer no worse mishap than the loss of his State charter.

Mr. R. L. POLK, of the *National Medical Register*, stated in a recent interview:

"That man Rutland has been carrying on this diploma business for about a year. He and his wife figure as president and secretary of the Wisconsin Eclectic Medical College, respectively. Some time back Rutland was in the habit of referring to our medical directory by name. But we stopped that and now he only mentions a medical and surgical directory, of course referring to ours, as there is no other published.

"I believe Rutland also did business in Chicago, and have a strong suspicion that he was connected with the defunct 'health university' of that city, the charter of which was recently annulled by the courts of Illinois.

"The *modus operandi* at the 'college' is said to be as follows: Students arrange for the examinations before a notary public of their town and if the examiners of this college can be 'satisfied' they can be legally and lawfully graduated, receiving the diploma of the college conferring the degree of doctor of medicine without attendance at the college.

"Last spring we received a letter from the secretary of the State Board of Health of Wisconsin, informing us that the Wisconsin Eclectic Medical College of 1809 Fond du Lac Ave., Milwaukee, is a diploma mill, and stating that the attorney general of the State would attempt to have the charter annulled in court. A letter recently received by us from Walter Kempster, Commissioner of Health of Wisconsin shows that the charter has been annulled and that the parties who carried on the institution have left Milwaukee. I believe they make their headquarters in the Garden City now."

In response to a telegram sent December 19 to the Attorney General of Wisconsin, we were informed that the case was still pending in the court, and that the charter of the institution has therefore not yet been annulled.

CORRESPONDENCE.

NEW YORK, Nov. 25, 1896.

To the Editor:—In your issue of October 31, page 968, is contained a communication signed Charles Graef & Co., in which that firm, endeavoring to make a correction of a former article in your esteemed paper, take occasion to say that: "The numerous Hungarian bitter waters coming from Buda-Pesth which are called 'Hunyadi' this or that, are strictly medicinal," and then refer to a high eulogy paid to a water recently introduced by them in the market, "'Apenta' from the Uj Hunyadi Springs in Ofen."

I desire to correct an apparent misconception contained in these statements which, if left unchallenged, can not fail to do great harm to the business of the undersigned. As a result of a protracted litigation carried on by Mrs. Emilie Saxlehner, widow of Andreas Saxlehner, against the Uj (new) Hunyadi Company, Limited, before the Royal Hungarian Minister of Commerce, a decision was rendered by him in August, 1896, by which the sole right of the firm of Andreas Saxlehner to the use of the word "Hunyadi" in connection with bitter waters was finally and authoritatively recognized on occount of the prior adoption of this name by him in the year 1863 and its continuous use for his "Hunyadi Janos" bitter water ever since that time.

I beg to send you enclosed herewith an abstract of the lengthy decision, from which you will see that the trademarks or names "Uj Hunyadi," "Uj Hunyadi Company Limited," and "Apenta" "Uj Hunyadi" registered by the defendant company in Buda-Pesth, have been canceled as conflicting with the exclusive rights of the firm of Andreas Saxlehner to the word "Hunyadi." Similar decisions have been made against all the various bitter waters which had adopted the word "Hunyadi" as a part of their names.

Without quoting at length from the decision against the Apenta (Uj Hunyadi) Water, I will only call your attention to the concluding sentence, in which it is said:

"The trademark forming the subject of these proceedings, while avoiding as much as possible exterior figural similarity, yet with respect to the designation of the article, evidently aims at identifying itself with the Hunyadi bitter water and at securing for itself by means of using this name that commercial position which the Hunyadi water has gained in the trade for thirty years."

The undersigned intends to protect his exclusive rights to the name "Hunyadi" water by appropriate action in court against all imitators of his labels or trademarks, but as proceedings of this kind are necessarily slow, I ask that you accord space in your valuable paper to this necessary correction. Respectfully yours, ANDREAS SAXLEHNER.

BLINDNESS is very common in Finland and other districts of the extreme north. It is attributed to smoky huts.

PUBLIC HEALTH.

The French National League Against Alcoholism.—One of the measures of the league is a public meeting occasionally on Sunday afternoons, when the dangers of alcoholism from a physiologic and medical point of view are presented by well known experts and the actual state of alcoholism exposed.

Lepers Flocking to Bogota.—Carrasquilla's announcement that he had succeeded in curing leprosy with his serum therapeutics has attracted great numbers of lepers to Bogota where he lives, until the Colombian government is dubious whether his alleged discovery may not be a calamity, especially as he stated that after the first injection the disease was arrested. This was assumed to mean that it ceased to be contagious and hence the lepers and the people no longer take precautions against the spread of the disease. The government and the Academy of Medicine are now investigating the permanent results of the treatment in a scientific and thorough manner, to determine whether it is best to continue the Carrasquilla Institute at its present capacity, which requires a monthly outlay of $6,000, or to reduce it and establish a great national leprosorium to exterminate the disease by isolation.—*Revista Médica de Bogota*, August.

Liability of City for Acts of Health Physician.—In the absence of a statute, the court of civil appeals of Texas says, in the case of Bates v. City of Houston, decided Sept. 17, 1896, that the liability of a city depends upon whether or not, in the acts complained of, its health physician was its servant or its agent engaged in the doing of an act for the private corporate benefit of the city, or was a public officer in the discharge of public governmental duties, in which latter event the city would not be liable. Here the city had been sued to recover damages alleged to have been sustained by reason of the acts of its health physician in quarantining the plaintiff's family because they were supposed to be afflicted with smallpox. The powers conferred upon the city council were ample enough to authorize an ordinance providing for the isolation and quarantine of persons infected with dangerous and pestilential diseases, and the court says that there can be no difficulty in placing this case clearly in the category of those in which the city is exercising a governmental duty for the general benefit of the public at large, and so it affirms a judgment in favor of the city.

Shall a Wet Nurse be Employed for the Child of a Cured Syphilitic?—Fournier's lecture on this subject is going the rounds of our exchanges, appearing in full in several languages. He decides the question most positively in the negative, except in mild cases that date from at least ten years back and received effective treatment at the time, with no manifestations for several years; otherwise, not. Even if the father has been cured for years, and whether the child shows traces of syphilis or not, the disease may be communicated to the nurse, and the physician should never lend his countenance to such an immoral proceeding, even if the nurse is willing for extra compensation to assume the risk. No one but a physician knows what that risk is. The mother should by all means nurse the child herself if possible, as such children need a mother's tender care more than others. She is protected by that strange provision of nature that the mother is never infected by her syphilitic child after birth. In all his extensive experience he has never known this law to fail. If it is impossible for the mother to nurse the child, it must be brought up on sterilized milk—"milk changed from a poison to a food by that great man whose name is recorded by some benefit to humanity on nearly every page of pathology."—*Presse Méd.*, November 25.

Premises that Menace Public Health.—In the case of Egan v. Health Department of the City of New York, where it was sought to obtain an injunction restraining the health department from enforcing an order requiring a tenement house to be vacated as unhealthy, affidavits were offered upon the part of the defendant to the effect that the sink in the yard was filthy, emitting offensive odors, and sour-smelling; that the cellar of the building was only five and one-half feet high, was not cemented, but damp through want of ventilation; that many of the rooms of the tenement in question were ventilated from a narrow space, at the bottom of which there were accumulations of dirt and filth which rendered the air foul, impure and unhealthy; and that the whole building was in a very offensive condition from dirt and vermin, was unfit for human habitation, and endangering the health of the occupants of the other houses in the vicinity. If the premises in question were in the condition sworn to, the appellate division of the supreme court of New York holds, Oct. 23, 1896, they were a public nuisance, which the board of health were justified in summarily abating. Its continuance would be a menace to the public health. And the foregoing allegations being in no way met by the plaintiff, who relied upon general allegations that no pestilence or contagious disease had ever occurred in the building; that all the sinks and drains were in perfect sanitary condition, and had been continually kept in that condition; that the entire plumbing and drainage of the premises were in perfect condition, and that the heights of the ceilings were seven feet seven inches, the court holds that the court below was justified in refusing to interfere, as a court should not, even if it had the power, except upon good cause shown, interfere in the measures taken by public officials to protect the public health. If the health department had acted without justification, the court points out that the plaintiff had her remedy at law, under laws 1882, chapter 410 (Consolidated Act), section 599, which provides that any person whose property may have been unjustly or illegally destroyed or injured pursuant to any order of a board of health, may maintain an action against it for damages.

The Health Report of the City of Chicago for November, 1896, contains the following extracts from a paper on the relation of the medical profession to the water supply of Chicago, read before the Chicago Physicians' Club, Nov. 30, 1896, by F. W. Reilly, M.D., Assistant Commissioner of Health:

The history of the efforts to secure a pure water supply for Chicago is inseparably connected with that of the medical profession of the city. Forty-seven years ago Dr. N. S. Davis arrived in Chicago in the height of the cholera epidemic of 1849. Before the epidemic was over he had traced the relationship between the greater incidence of the disease in certain localities and the use of water from surface wells, and at once began an agitation for pure water from the lake. During the summer of 1850 he delivered a course of lectures on the sanitary conditions of the city and pointed out the means for their improvement. The plans he then suggested for a pure water supply and for its necessary complement—the proper disposal of the sewage of the city—are the basis of all that was done toward these ends during the subsequent forty years.

Only the merest mention may be made of those who followed the initiative of Dr. Davis and persistently pointed out the evil effects of impure water and urged measures for preventing the pollution of our source of supply. The roll would include the names of almost every man prominent in the profession in the early days, Brainard, Egan, McVickar, Boone, Paoli, Ross, Lyman, Holmes, Byford and their colleagues, among whom may be especially noted Dr. James Van Zandt Blaney, who, while the writer was an assistant in his laboratory in "Old Rush" in 1855-56, made the first chemic analysis of Lake Michigan water; Dr. Hosmer Allen Johnson, subsequently a sanitarian of national reputation, and Dr. Edmund Andrews, whose report on the erysipelas epidemic of 1863 was a scathing indictment of the municipal indifference which had allowed the river to become an open cesspool, with here and there an independent pollution, which he describes with grim humor, as answering "every purpose for the increase of medical practice in general and of erysipelas in particular."

To no other member of the medical profession, however, if to any other citizen, does Chicago owe so much in this connection as to the late Dr. John H. Rauch. Indefatigable as were his labors in the cause of medical education and far-reaching as were their results during his lifetime, his efforts toward the

solution of the sanitary problems of Chicago were of even greater and more direct importance to the prosperity and the health of this community. The work that he did lives after him in the parks and boulevards of the city; a direct result of his monograph on "Public Parks; Their Effects upon the Moral, Physical and Sanitary Conditions of the Inhabitants of Large Cities, with Especial Reference to Chicago." It lives after him in the suburban cemeteries which now receive the city's dead, without offense or menace to the living; the result of a paper read before the Chicago Historical Society in 1858, entitled "Intramural Interments in Populous Cities and Their Influence upon Health and Epidemics." His work lives after him in the present drainage and sewerage system, which he so persistently urged, and concerning which, in his report to the Chicago Board of Health in 1869, when the average death rate for twenty-five years had been over thirty in the thousand—he wrote as follows:

> From the results of drainage and other sanitary measures carried on in this city, it may be inferred that the judicious expenditure of money for sanitary purposes is a sound maxim of municipal economy, and from past experience I am satisfied that the mean annual death rate can be reduced to 17 per 1,000 by continuing in force the present sanitary and drainage regulations, thereby making Chicago one of the healthiest cities in the world.

In his presidential address before the American Public Health Association he cited this prediction, together with other passages from his reports and papers, with the following comment:

> I introduce these quotations simply to show that sanitary science has made sufficient progress at the present time to admit of the supreme test which science falsely so-called can never endure—that of verification by subsequent experience.

Dr. Rauch fortunately lived to see the verification of his prophecy "by subsequent experience." The year before his death, in March, 1894, the mortality rate of the city was only 16.9 per 1,000 of its population—a fraction less than that which he had asserted, twenty-four years before, was attainable if the plans originally formulated by Dr. Davis in 1850 should be carried out.

And Rauch, too, was a prophet not without honor—save among his own people.

He lived, however, to see the fruition of his efforts for the protection of the water supply of the city in the advanced stage of work on the great sanitary waterway and drainage channel. He foreshadowed in a general way, the plan, now in progress, for the ultimate disposal of Chicago sewage and consequent protection of the water supply, in his annual report for 1869, and from that time until work on the sanitary waterway was actually begun he continued to accumulate facts and present arguments which were finally successful. Probably no other one demonstration had more weight in determining the adoption of the present plan than that developed in the study and collation of the results of Prof. J. H. Long's analyses of the sewage contents of the Illinois and Michigan Canal and of the waters of the Illinois River as far south as Peoria, made in the summer of 1886. These analyses were part of a plan projected by Dr. Rauch, and carried out under the direct supervision of the writer, for an investigation of the water supplies of the State, with especial reference to the progressive decomposition of sewage in running streams, first between Chicago and St. Louis and subsequently in other Illinois water courses.

My collation of Prof. Long's analyses between Bridgeport and Peoria showed that more than one half the sewage pollution of the canal disappeared before reaching Lockport; nearly one-third of the remainder was lost in the next four miles, or 33 miles from Bridgeport; while at Channahon, 48 miles from the city, no trace of sewage was detected. These results were so unlooked for that Dr. Rauch hesitated to accept them. Water analysts had asserted that the self-purification of a polluted stream was impossible—as one phrased it, "no river in the world is long enough to purify itself after it has once been contaminated with organic matter."

The investigations were, therefore, repeated in the following winter, 1886 87, again in the summer of 1888 and still again in the spring of 1889, with substantially similar results in every case. Subsequently Prof. Pettenkofer caused a similar investigation to be made of the river Isar, which receives the sewage of Munich. Within a mile below the point at which the Isar receives the Munich sewage the *beggiotoa*, or sewage fungus, was found growing in abundance; but the last traces were found at Garching, less than ten miles below Munich. The chemic analyses gave corroborative results, while Pettenkofer himself reports that he found 198,000 bacteria to the cubic centimeter at the mouth of the sewer and only 3,600 at Freising, twenty miles below. He distinctly asserts that "*sewage is decomposed in running streams and is rendered harmless in the course of a few miles' flow.*" . . .

There is no scientific ground for believing that Chicago sewage ever reaches the Mississippi river; while as for the Illinois its waters are naturally not potable and have long since been abandoned by many of the valley towns as a source of water supply. It has its origin chiefly in marshy areas, whence it becomes highly charged with organic matter, is malarious, readily stagnates and has scarce enough free oxygen to support fish life. With the contribution, through the drainage channel, of from 300,000 to 600,000 cubic feet of water per minute from Lake Michigan with its excess of oxygen, not only the navigable and economic, but the sanitary conditions of the river will be immensely improved. Mr. Lyman E. Cooley, who has already addressed the Club on this subject, recently suggested to the writer that the profitable disposal of sewage may, after all, lie in this direction. Fish will not live in the Illinois above Morris, 60 miles from Chicago, nor for 20 to 30 miles below Peoria—beyond which distance the stream purifies itself so that fish are again found. U. S. Fish Commissioner Bartlett reports that in 1893 eleven million pounds of fish were taken from the other stretches of the river—a more profitable crop, as Mr. Cooley puts it, than any garnered from the prairies of the State, acre for acre.

Section 20 of the Sanitary District Act provides that the degree of dilution in the drainage channel shall not be *less* than 200 cubic feet per minute for every 1000 inhabitants, and it *must* be as much more as is found necessary to keep the waters of the channel in a condition "neither offensive nor injurious to the health of the people of the State." With this condition maintained it is believed that fish will live in its waters throughout, except at sewer mouths or in the vicinity of special pollution. It is certain that they will be restored to the full length of the Illinois river, to convert the wastes and refuse of every town upon its banks into a profitable food crop. . .

Such adverse criticism of the drainage channel as is still met with is generally found, on examination, to be due to misconception of its character and purpose. Its essential purpose is to keep Chicago's sewage from polluting Chicago's twenty-odd miles of lake frontage and the lake itself, from which its water supply is drawn. This is a sanitary necessity even though every drop of Chicago's drinking water should be filtered or otherwise purified—as it will have to be unless relief is speedily afforded through this channel and its essential complement, the intercepting sewers. In character, it is a new tributary of the Illinois river, with a less degree of organic impurity than any other of its tributaries, and destined to materially improve the sanitary conditions of the entire Illinois Valley—the "great malaria preserve of the State," as it has been called. . . .

Prefacing a chapter on the medical history of Chicago, a local historian has writen:

"When negligence permitted the condition of the city to become unhealthy in the extreme—an invitation to epidemics—the physicians persistently sounded the alarm that ultimately caused the citizens to demand of the authorities purification and the establishment of sanitary laws and officials. The system of sewerage adopted by the city was substantially a mode suggested by a physician. The method of drainage was that promulgated by a physician"—and in every effort for the betterment of the conditions of life in Chicago the physicians of Chicago have been the pioneers.

Disinfection of Infected Apartments by Vapor of Formaldehyde.—In *Hospital*, July 25, Dr. H. W. Jones gives an account of some of the latest work done with formaldehyde as a disinfectant of rooms and hospital wards. The experiments of Drs. Roux and Trillat have shown that the dust on the walls could be completely sterilized; in the case of dust on the floor the sterilization was not so complete. In one case, specimens of dust from the sweepings of a house were placed in twelve receptacles in different parts of an inhabited house of three stories. Ten liters of formalin were used, and the apparatus allowed to work for four hours. Half the specimens used for sowing on bouillon were washed in ammonia. The result was as follows: Ground floor, four specimens; bouillon cloudy after forty-eight hours in two cases. Room furthest away, three specimens; bouillon clear in all cases. Room on first floor, one specimen, all the bouillons clear. Room on second floor, four specimens, all clear. There was nothing extraordinary in the fact that two of the specimens on the ground floor were not sterilized, as they were near a very badly fitting door. "As regards penetrating power, the results are no less conclusive. Thus Dr. Bosc of Montpelier, found that staphylococci concealed in the pocket of a coat, and colon bacilli placed under a mattress folded on itself, were rendered absolutely sterile. Roux and

Trillat have discovered an ingenious method of testing this penetrating power. The action of formaldehyde on gelatin is to render it insoluble; to make use of this property as a test, little cubes of glass are coated with liquefied gelatin. When the gelatin has set, these are placed in various positions in the room which is being sterilized, and after the process is completed examined by immersion in boiling water. It is found that on those cubes which have been exposed to the action of formaldehyde, the gelatin coating is insoluble. Another test, used by the same observers, depends on the power which formaldehyde possesses of converting anilin reds into blues or violets. Bits of cloth dyed with fuchsin can be used in this way as tests, or a combination of this and the gelatin test can be used, the gelatin being dyed with fuchsin before the glass cubes are coated. Roux and Trillat further demonstrate that animals can live in an atmosphere that has been treated by formaldehyde vapor, if precautions are taken to first get rid of the vapor. This is done by washing first with a solution of ammonia, and then with sulphuric acid. This treatment would have no chemic action on any oxids of carbon that might have been formed during the disinfecting process, so that it may be taken as proved that the process is unattended by any risk for the evolution of carbonic oxid. There is yet another point which has been brought out by these experiments on formalin. It has been proved by Pottevin and also by Roux and Trillat that to obtain the best results a temperature of 35 degrees F. is necessary. Still, it was found by actual experiments in rooms that it is possible to completely sterilize walls, ceilings, floors, dust, air, and all contents at the ordinary temperatures. There can be little doubt that from the point of view of preventive medicine, this is one of the most important practical discoveries that has been made for many years."

ASSOCIATION NEWS.

List of Presidents of the American Medical Association.

To answer inquiries and for the information of the members we have compiled a list of the Presidents of the ASSOCIATION from the beginning:

Dr. Jonathan Knight, (President of the convention).	
Dr. Nathaniel Chapman	1847–48.
Dr. Alexander H. Stevens	1848–49.
Dr. John C. Warren	1849–50.
Dr. Reuben D. Mussey	1850–51.
Dr. James Moultrie	1851–52.
Dr. Beverly R. Wellford	1852–53.
Dr. Jonathan Knight	1853–54.
Dr. Charles A. Pope	1854–55.
Dr. George B. Wood	1855–56.
Dr. Zina Pitcher	1856–57.
Dr. Paul F. Eve	1857–58.
Dr. Harvey Lindsley	1858–59.
Dr. Henry Miller	1859–60.
Dr. Eli Ives	1860–63.
Dr. Alden March	1863–64.
Dr. Nathan S. Davis	1864.
Dr. Nathan S. Davis, (held over)	1865.
Dr. D. Humphreys Storer	1866.
Dr. Henry F. Askew	1867.
Dr. Samuel D. Gross	1868.
Dr. William O. Baldwin	1869.
Dr. George Mendenhall	1870.
Dr. Alfred Stillé	1871.
Dr. D. W. Yandell	1872.
Dr. Thomas M. Logan	1873.
Dr. Joseph M. Toner	1874.
Dr. W. K. Bowling	1875.
Dr. J. Marion Sims	1876.
Dr. Henry I. Bowditch	1877.
Dr. T. G. Richardson	1878.
Dr. Theophilus Parvin	1879.
Dr. Lewis A. Sayre	1880.
Dr. John T. Hogden	1881.
Dr. J. J. Woodward	1882.
Dr. John L. Atlee	1883.
Dr. Austin Flint	1884.
Dr. Henry F. Campbell	1885.
Dr. William Brodie	1886.
Dr. E. H. Gregory	1887.
Dr. A. Y. P. Garnett	1888.
Dr. W. W. Dawson	1889.
Dr. E. M. Moore	1890.
Dr. Wm. T. Briggs	1891.
Dr. Henry O. Marcy	1892.
Dr. Hunter McGuire	1893.
Dr. James F. Hibberd	1894.
Dr. Donald Maclean	1895.
Dr. R. Beverly Cole[1]	1896.
Dr. Nicholas Senn	1897.

SOCIETY NEWS.

The Northwestern Ohio Medical Society held its fifty-second meeting at Defiance, December 10 and 11. The following officers were elected: President, Dr. Joseph Sager of Celina; vice-presidents, Drs. James A. Duncan of Toledo and R. D. Dihle of Lima; secretary, Dr. J. P. Baker of Findlay; treasurer, Dr. L. M. Gehrett of Deshler. Dr. J. P. Baker of Findlay read an elaborate paper on "Treatment of Diphtheria by Antitoxin," in which he reported twenty-nine cases with the following results: Number of cases treated with antitoxin 23, number of cases of laryngeal invasion 6, number of deaths 1; 9 cases received antitoxin first day, 4 the second day, 4 the third day, 2 the fourth day, 1 the fifth day, 1 case, stage of disease indefinite; 13 cases received one injection, 6 received two injections, 1 received three injections, 1 received four injections. The antitoxin was supplemented by protonuclein combined with calomel enough the first day to act freely on the bowels. Protonuclein special was blown into the throat and after third or fourth day a tonic of iron, strychnia and calisaya bark was given.

Twelfth International Medical Congress.—Claudius H. Mastin, M.D., of Mobile, Ala., has been requested, and has consented, to serve as one of the members of the American National Committee of the Twelfth International Medical Congress to be held in Moscow, Aug. 19–26, 1897. The Central (Moscow) Executive Committee consists of the following gentlemen: President, Prof. I. F. Klein; vice-president, Prof. A. J. Kojewnikow; treasurer, Prof. N. F. Filatow; Secretary-General, Prof. W. K. Roth; Secretaries, Profs. P. I. Diakonow, W. A. Tikhomirow and I. I. Hoyding; members, Profs. S. S. Korsakow, J. F. Ognow and W. D. Chorwinsky. It is officially announced that preparations are being made for the reduction of Transatlantic steamer and European railroad fares.

A. JACOBI, M.D., Chairman Amer. Nat. Com.

The Western Ophthalmological, Otological, Laryngological and Rhinological Association will meet in St. Louis, Mo., the second Thursday and Friday of April, 1897, under the presidency of Dr. Adolph Alt. Physicians desiring to read papers are invited to send their subjects to secretary at once. Railroads will give us one and one-third fare on the certificate plan. Programs will be mailed Feb. 1, 1897. The profession are cordially invited to attend. HAL FOSTER, M.D., Sec.

NEW INSTRUMENTS.

A NEW OBSTETRIC FORCEPS.

BY A. B. SPÄCH, M.D.
CHICAGO.

Of the making of many instruments as well as "of the making of many books there is no end." This would appear especially true in the obstetric art, for there seems as many forceps as there are individual obstetricians. However, the forceps herein described and delineated is believed to possess advan-

[1] Inadvertently omitted in last publication.

tages heretofore not brought out in any other instrument. When it is considered that the primary object of the forceps is traction, Figure 1 will of itself indicate the merit claimed for this instrument.

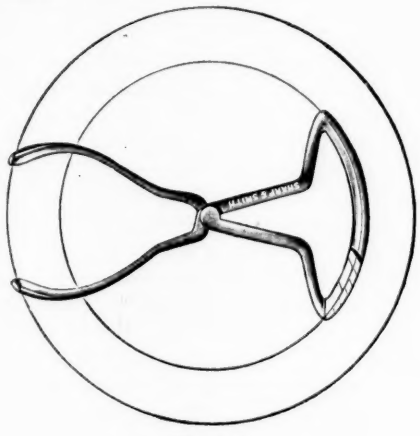

Figure 1.

It will be observed that the lock is at the center of two equal circles (the outer circle in the figure is not to be considered in the description), of which the handles are arcs, and which, at any angle made by the blades while grasping the fetal head,

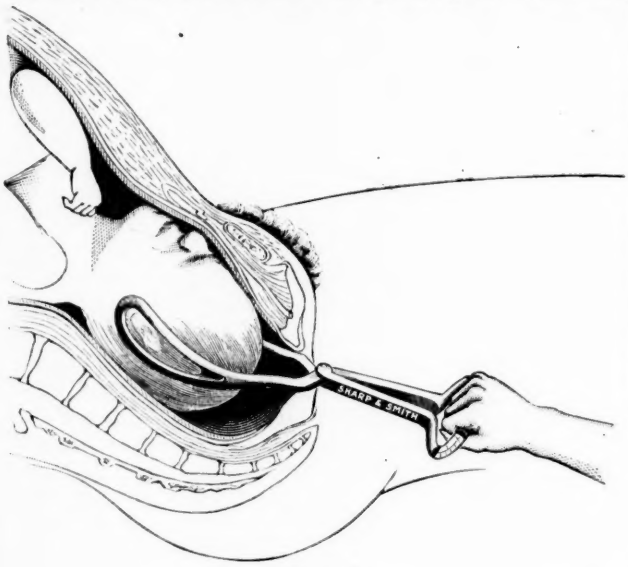

Figure 2.

constantly coincide (overlap). The lower arc is marked off in centimeters and inches, which continually measures the diameter of the fetal head. This will enable the intelligent obstetrician to avoid making undue compression of the child's head.

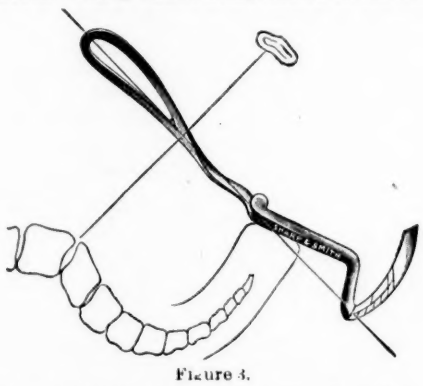

Figure 3.

Figure 2 represents the forceps in cases where it was recently employed in occipito-posterior positions, and Figure 3 when applied at the brim. There are no set screws and the instrument is aseptable. The two main advantages claimed, which are considered paramount, are traction and avoidance of undue compression of the fetal head. There are some minor features relative to the lock and curve of the blades that are new.

This instrument is manufactured by Sharp & Smith of Chicago.

BOOK NOTICES.

Twentieth Century Practice, an international encyclopedia of modern medical science by leading authorities of Europe and America. Edited by Thos. L. STEDMAN, M.D. In twenty volumes. Vol. vii, Diseases of the Respiratory Organs and Blood and Functional Sexual Disorders. 8vo. Cl. pp. 796. New York: Wm. Wood & Co. 1896.

The contributors to this volume are: Chas. W. Allen, M.D., New York; Jules Comby, M.D., Paris; C. G. Cumston, M.D., Boston; E. W. Cushing, M.D., Boston; James M. French, M. D., Cincinnati; E. Fletcher Ingals, M.D., Chicago; E. Main, M.D., Paris; Franz Riegel, M.D., Giessen; Alfred Stengel, M.D., Philadelphia; Herbert B. Whitney, M.D., Denver.

The topics include, 1, diseases of the pleura; 2, asthma; 3, hay fever; 4, diseases of the mediastinum; 5, diseases of the diaphragm; 6, diseases of the blood; 7, rachitis; 8, disorders of menstruation; 9, functional disorders of the male sexual organs; 10, chemic and microscopic examination of the urine.

The chapter on diseases of the diaphragm is by Dr. Main, and the difficulties under which the author labors in meeting the task assigned him, are about as great as if he had been assigned to write upon the diseases and injuries of the deltoid or of the gluteus maximus. However, the author frankly acknowledging the difficulties, has made a fairly readable article. He speaks of the traumatic affections, but does not mention hernia, and he writes of rheumatism and neuralgia, but does not refer to the assaults of trichinæ, although, as is well known, the diaphragm is very frequently the seat of trichinosis. The chapters by the other authors call for no special remarks, except to compliment them on making reliable and trustworthy articles on their respective topics. This system, when complete, if the accomplished editor keeps up the standard thus far kept, will be at once our most exhaustive and most authoritative book on practice.

The Medical Directory of the City of New York. Published under the auspices of the Medical Society of the County of New York. Price $1 00. New York: Press of Richard Herrmann, 232 William Street, 1896.

This directory contains the usual list of physicians corrected to date, beside many matters of interest to physicians, compilations of medical laws relating to the practice of medicine and pharmacy, benevolent societies, asylums and homes, extracts from by-laws of the Medical Society, etc.

Essentials of Physical Diagnosis of the Thorax. By ARTHUR M. CORWIN, M.D., second edition, revised and enlarged. Cloth, pp. 199. Price $1.25 net. Philadelphia: W. B. Saunders, 1896. Chicago agent, W. T. Keener.

This little book, originally intended as an aid in the instruction of his own classes, has grown into national favor. Its scope has been somewhat extended, and practitioners wishing to refresh their memory on doubtful points in physical diagnosis of the diseases of the chest will find the work useful to them.

A Pictorial Atlas of Skin Diseases and Syphilitic Affections. In photo lithochromes from models in the museum of the Saint Louis Hospital, Paris, with explanatory woodcuts and text by Ernest Besnier, A. Fournier, Tenneson, Hallopeau, Du Castel and Henri Feulard. Edited and annotated by J. J. PRINGLE, M.B., F.R.C.P. Part v. 4o., paper. Philadelphia: W. B. Saunders, 1896. Chicago agent, W. T. Keener.

This magnificent pictorial work is issued with regularity and with great care. The contents of this section are: 1, agminate tricophytic folliculitis (Sabourand); 2, lupus pernio (Tenneson);

3, papulo-tuberculous syphilides (Hallopeau); 4, dermatitis vacciniformis infantilia (Hallopeau); 5, acute ecthyma of infancy (Hallopeau). The reproduction from the models in the Hôpital St. Louis continue to bring their faithful pictures to the eye of the profession generally, and the explanatory text is as a personal guide, without which many of the lesions portrayed in the museum would be but imperfectly understood.

NECROLOGY.

LEONARD J. SANFORD, M.D., died in New Haven, Conn., December 12, after a cardiac illness of two weeks. He was born in that city Nov. 8, 1833, and was a graduate of Jefferson Medical College, class of 1854. He began practice in his native place one year afterwerd. He received the honorary degree of M.A. from Yale in July, 1858, and was appointed professor of anatomy and physiology at Yale in May, 1863. Since that time he has given an annual course of lectures on these subjects, and also upon hygiene in the medical and other departments of the university.

CHARLES N. WOOLLEY, M.D., an ex-president of the board of education in Newburg, N. Y., died December 11, after a protracted illness, aged 58 years. He was born in Southampton, N. Y., was a graduate of Michigan University and ultimately of the Long Island Hospital Medical College in 1868.

GUIDO FURMAN, M.D., son of a Lutheran clergyman, born in Nassau, Germany, Jan. 17, 1831, was a graduate in 1856 of the New York University Medical College. He was elected in the earlier days Secretary of the AMERICAN MEDICAL ASSOCIATION, and subsequently held many positions in the medical societies and also appointments in the Sanitary Commission during the late war and in the New York Health Board. He was in the enjoyment of a profitable practice until failing health compelled a resignation of his duties for some years before his death, which occurred December 2, at his home in New York city.

COLIN J. HACKETT, M.D., died in LeMars, Iowa, aged 56 years, November 26. He was an alumnus of both the Medical College of Virginia (1860) and the New York University Medical College (1861). Beside being a member of the National Association of Railway Surgeons, he was long identified with the AMERICAN MEDICAL ASSOCIATION.

THOMAS A. FOSTER, M.D., Medical Director of the Union Mutual Life Insurance Co., of Maine, died November 27, aged 69 years. He was a member of the class of 1856, Pennsylvania Medical College, Philadelphia.

CHARLES S. FLOOD, of Austin, Pa., died at his home November 27. He was a graduate of the Jefferson Medical College, class of 1887.

MISCELLANY.

Scarcity of Physicians in Cuba.—There are only 51 physicians it seems for the 13,657 sick distributed in the hospitals, etc., throughout six provinces in Cuba, and the Inspector-General has appealed to the Spanish Government for more, according to the *Bulletin Méd.*, of November 11.

Personal.—Dr. Howard Kelly of Johns Hopkins Hospital has returned from his European trip, much improved in health. President Nicholas Senn of Chicago will spend the holidays hunting in the West. Dr. P. O. Hooper of Little Rock, Ark., has been appointed superintendent of the Arkansas State Insane Asylum. Dr. J. R. Pennington has resigned the Chair of Rectal Diseases in the Illinois Medical College, Chicago.

Some Statistic Gleanings.—In the Paris hospitals over 20 per cent. of the typhoid cases prove fatal.——Shanghai, China, is almost free from cases of infantile convulsions.——Over 50 per cent. of the cases of croup in Sweden and Norway are fatal.——One of every ten cases of sickness in England is due to rheumatism.——Mulhall says that in 10,000 deaths in Missouri 750 are from phthisis.—Smallpox is more prevalent at Rome than in any other European city.——In the smallpox epidemic at Leipsic in 1871 the death rate from this cause rose to 12,700 per 1,000,000.

Sensibility of the Eye to the Roentgen Ray.—The Roentgen ray is invisible to the normal eye, but it has been found that ablation of the crystalline lens renders it visible. A child upon whom this operation had been performed was submitted to the ray, her head in a wooden box, on which the ray was directed from outside. She saw nothing but darkness with the sound eye, but with the other the space was filled with light and she could see clearly through the walls of the box the outlines of objects without, that intercepted the ray, which presented to her view the aspect of the radiograph with which we are all so familiar. —*Presse Méd.*, November 15, from the *Rev. Gén. des Sciences.*

Medical Aid for Cuba.—The physicians of several of the cities in the United States having been aroused by reports of suffering in the Cuban papers, have started subscription lists to buy medicines, etc. The movement was inaugurated by the physicians of St. Paul. A committee, consisting of Drs. Kelly, Wheaton and Boeckmann, have raised several hundred dollars for this purpose. It is expected, if necessary, that the supplies and medicines contributed can be sent under protection of the Red Cross Society, as no articles contraband of war will be sent.

Surgeon-extraordinary to Queen Victoria.—Americans who are familiar with Bryant surgery, will be pleased to learn that Thomas Bryant, F.R.C.S., has been appointed Surgeon-extraordinary to Queen Victoria, the place being made vacant by the death of Sir John Erichsen. Mr. Bryant is very popular with the College of Surgeons, and has held all the important offices, those of examiner, vice-president and president, the last-named title being held by him for three successive terms. At the present time Mr. Bryant is the college representative on the general medical council and at the last election of the college council he was elected at the head of the poll.

Indian Treatment of Smallpox.—Incidentally an interesting historic fact is brought out in the land title case of Reynolds v. Campling, wherein the supreme court of Colorado handed down a decision Sept. 21, 1896. The plaintiff sought to prove the death in 1862 or 1863 of the patentee, one Armama Smith, an Indian woman, whom the defendant contended was still living in 1894. In the oral argument before the supreme court, the latter says counsel called attention to the evidence of death, which he urged occurred under such peculiar circumstances as to leave no doubt of the time being as stated. These circumstances were as follows: She was suffering from smallpox and that, when the fever arose, she ran and jumped into a stream of water, as was the custom of the Cheyenne Indians, and that her death followed immediately. The court does not seem to doubt the correctness of the conclusion, if the premises are true, though it intimates that there may be some mistake as to the identity of the patentee, which can be cleared up on a new trial. It may be stated here that this practice was not confined to the Cheyenne Indians, but was the common practice of most of the northwestern Indians.

Relations Between the Motor Oculi and the Ciliary Ganglion.—While it has been assumed that the ciliary ganglion belonged to the motor oculi nerve, as also its sympathetic nature, physiologic investigation has never established this beyond a doubt, which Apolant has now succeeded in accomplishing by the application of Marchi's method. He experimented on young cats, as this ganglion is comparatively large in them, and the short ciliary nerves contain myelin. He announces that the fibers entering the ganglion from the motor oculi nerve end there, with their terminals blending with the fibrils of the ganglion

cells. The motor oculi nerve was cut before its entrance into the sinus cavernosus and only young animals survived the operation. They were killed from eight to fourteen days afterward, and the ganglion with the entire contents of the orbit, prepared and treated by the Marchi method. The ganglion of the sound side was also treated in the same manner. He never succeeded in tracing any of the degenerated fibers of the motor oculi past the ganglion to the periphery, consequently the cells of the ganglion are to be considered as the beginning of a new neuron. The experiments also furnished the proof that the ganglion can not be spinal, as in that case the sectioned fibers of the motor oculi would have degenerated toward the nucleus and not toward the ganglion.—*Cbl. f. Phys.*, November 14.

Influence of the Vagus on the Kidneys.—A series of experiments described in the *Gazzetta d. Osp. e d. Clin.* of November 22, have demonstrated that the vagus plays an important part in the innervation of the kidneys, contrary to what has been hitherto assumed. Section of the vagus on one side produced in animals marked renal disturbances and albuminuria. The frequency of nervous manifestations in diabetes, the numerous observations of lesions in the vagus in diabetes, the probability of a nervous origin for the disease, the possibility of producing not merely glycosuria, but an actual experimental diabetes by lesions of the nerves, and particularly by lesions of the vagus, all of these facts incline Boeri to query whether the albuminuria of diabetics may not be referable to the vagus and whether the renal lesions in diabetes may not be interpreted as a degeneration of the renal epithelium, a trophic disturbance. The albuminuria that accompanies a permanently slow pulse may also with all probability be ascribed to the vagus. The slow pulse and the other symptoms may be concomitant symptoms of the lesion of the vagus, instead of, as Comby supposes, that the lesion of the vagus is due to degeneration caused by the slow pulse.

Registration of Physicians in Massachusetts.—Chapter 230 of the Massachusetts laws passed in 1896, provides that all applications for registration as physicians or surgeons under the provisions of chapter 458 of the acts of 1894, shall be made upon blanks to be furnished by the board of registration in medicine, and shall be signed and sworn to by the applicants. It further requires that such board shall examine all applicants, and only such as are found qualified and shall give satisfactory proof of being twenty-one years of age and of good moral character shall receive certificates of registration as provided in said act; provided, however, that said board shall register without examination any applicant whom it may find to be of good moral character, of more than sixty years of age, and a graduate of a generally chartered medical college having power to confer degrees in medicine, and who has been a practitioner of medicine in the commonwealth of Massachusetts for a period of ten years next prior to the passage of this act (which was approved April 1, 1896), and who otherwise complies with the provisions of this act. Said board may by unanimous vote, after a hearing, revoke any certificate issued by it to, and cancel the registration of, any person convicted of any crime in the practice of his professional business, or convicted of a felony. Any person who shall practice medicine or surgery under a false or assumed name, or under a name other than that under which he is registered, or shall personate another practitioner of a like or different name, shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars for each offense, or by imprisonment in jail three months, or by both.

Good Tenements that Pay.—Dr. E. R. L. Gould of Johns Hopkins University says that "Of all the model tenement houses in cities of 100,000 and over in this country and the Old World, 88 per cent. are on a paying basis." It is relatively a modern idea that works of benevolence should be made to pay. The profits on them have generally been regarded as remote, if not contingent. The riches they might be expected to bring in were not susceptible of deposit in banks, but must be laid up elsewhere to await the claimant. The older idea has not wholly gone out, and never will, for all the scientific teaching of the time can not dispel the charm of free giving, even if the giving be practically useless and possibly harmful. But the modern idea has in it, nevertheless, an element of common sense, developed by long and varied experience and pregnant with great good to society. What is sought and got in the model tenement house may be said to be not charity, but beneficence; it does not simply relieve the suffering or allay the miseries of the poor, it aids directly and efficiently to remove the causes thereof and prevent their recurrence. It makes permanent conditions of life not merely easier but better, by making the scant earnings of tenants go further and bring in more. It promotes health and lengthens life by giving better air and light, and guarding against the sources of disease. These things add to the wage-earning power of the occupants of such dwellings. The moral gain is not less important. Apart from the demoralizing influence of dirt and crowding and discomfort, the unfit tenement saps self-respect, weakens the resistance to temptation, aggravates the evil passions and breeds the habit of unmanly and unwomanly conduct. The good tenement does exactly the opposite.—New York *Times*.

"Homeopathy" and Venesection.—Following the example of Hahnemann, whose powers of wandering from the hackneyed limits of the actual were unlimited, the average homeopathic fanatic perennially eulogizes homeopathy as the deliverer from venesection. The fact is, however, that long before the homeopathic fungus sprouted, a current was setting in against the abuse of venesection. Hahnemann assimilated quietly Störck's views concerning venesection without acknowledgment and distorted these just as he did other therapeutic stealings from Störck. Hahnemann (Chronic Diseases, page 177) remarks: "The homeopathist has dispensed with the necessity of employing the barbarous practice of bloodletting. Beginners and learners may be pardoned for using depleting processes, but if they dare to pride themselves on their pretended improvements and promulgate bloodletting and cupping as processes that are entirely homeopathic, then they make themselves ridiculous. They ought to be pitied for their dabbling and for their patients. It is laziness, or is it a foolish predilection for the pernicious routine of allopathy which prevents them from making themselves acquainted with the true 'homeopathic' remedy?" The New York homeopathists adopted this system. Dr. Gray, one of their leaders, remarks (*Homeopathic Examiner*, vol. iv, 845): "Bloodletting I have not ceased to employ during the eighteen years of my acquaintance with homeopathy; at first by advice of my learned and lamented predecessor, Dr. Gram, it was continued on purely empiric grounds, but now and for many years past I apply it upon the homeopathic basis, having acquired, partly by experiment partly by reading 'allopathic' authorities to that end, a tolerable pathogenesis of it."

Study of "Resultant Tones" and Their Acoustic Phenomena.—The Helmholtz theory in regard to the resultant tones, as the tones are called which accompany the simultaneous sounding of two harmonious notes, the number of whose vibrations is equal to the difference between the vibrations of the two primaries, scarcely explains them to our satisfaction, Meyer states in a recent article. After proving what some deny, that such notes really exist, he asserts that overtones are not necessary to their formation, as he established by experiment in which he neutralized the overtones by interference. He also found that two resultant tones can produce a new resultant tone (tuning

forks), as also occurs when to the resultant tone an objective tone wave is added, the number of whose vibrations is not too far removed from the other. With the rotating apparatus he also established the fact that at least five vibrations are necessary for a tone to be audible. He was unable to distinguish Hermann's hypothetic "interrupting tones." He also states that the theories of Wundt and Hermann do not satisfactorily explain the process of the production of resultant tones in the ear and advances a theory himself which does not supplant that of Helmholtz, but merely extends it. He first analyzes the tone wave and shows how perfectly a mathematical demonstration of it would correspond to what would occur in the case of a rod fastened at one end and free at the other. Its imperfect elasticity would cause any imparted wave arriving at the free end to be gradually deadened and finally die away altogether. If instead of the one rod he were to substitute a jointed rod, each joint supplied with a nerve (a certain length of the rod equals a certain number of ganglion cells), and assuming that chemic transformations correspond to every stimulus of the cells, depending qualitatively on the number of stimuli in a certain unit of time, he then applies the whole to the organ of Corti. Its membrane is set in motion by the objective sound wave in the same manner, and the whole wave is divided in the same way by the rods in all the Corti arches, which correspond to the rods described above. This theory does not harmonize with that which imputes a specific energy to the nerve cells, but is a return to the theory of the effect of the form of the curves on the auditory sensations, only instead of speculative we have a mechanical demonstration—*Cbl. f. Phys.*, November 14.

The Apotheosis of the General Practitioner.—The Rev. Dr. Watson ("Ian Maclaren"), the recipient of "Bonnie Briar Bush" ovations in our East, gave in one of his last readings his most charming tale, "A Doctor of the Old School." Regarding other medical matters in his writings he is reported as having said:

"I don't want you to think I am a mere ignorant layman, writing these things from my inner consciousness. You must remember that a clergyman sees a great deal of sickness, but in order to make sure that there should be no inaccuracies in my book I had my book revised by a physician whose name is known both in America and England. By his advice I shortened the time of Annie Mitchel's operation. I had allowed an hour and a half, but he said an hour would be enough, and I was so glad on Tammas's account. One reviewer was scandalized at my treating typhoid fever with cold water. I think he was writing without knowledge, and when I read such things I always have five minutes of absolutely sinless enjoyment."

Speaking of his Sir George's farewell to Dr. McClure, and his solicitude about the antiseptic dressings, Dr. Watson said that when his countrymen got very near the verge and were in danger of falling over, they always took "antiseptic precautions." Before beginning the reading the Doctor gave a little introduction, explaining the moral of the story.

"Immediately after the publication of this work of a new and unskilled writer," he said, "I began to receive letters, and am still receiving them, from people who are sure that they know the original Dr. McClure. These letters come from all parts of the world—from New South Wales, New Zealand and the Cape of Good Hope, from all parts of England, Scotland and Ireland, and from the United States. In fact it would appear that there is not a State in the Union where Dr. McClure is not alive today. I have just had a communication from one of the Western States declaring that all of my other correspondents are wrong, for they have the real, genuine Dr. McClure out there. Surely this unanimous testimony to the heroism and unselfishness of a great profession is a new proof that the goodness of the world is more than we have ever imagined or believed. It establishes our faith in man and in the Eternal, and this is the moral of the story."

Again touching the "crossing of the ford" incident, now so popular, the author said there was a foundation on fact. An eminent physician and a country doctor were the actors, and the former used language much plainer than anything he (Dr. Watson) had ventured to put into his book.

Medicated Electrolysis.—The favorable results secured by Boisseau de Rocher with electrolysis with sodium bromid, reported at a recent meeting of the French Society of Electro-therapeutics, are given in full in the *Presse Méd.* of November 25, with observations of several cases of local tuberculous affections completely cured by one or two applications in recent affections, when the improvement is evident at once, and by two to twenty-five applications in old tuberculous joint and osseous affections, when the patient showed improvement in about fifteen days and the final cure was definite in six weeks. The solution of sodium bromid is injected into the diseased tissues or the suppurating cavity, and then by means of a platinum trocar attached to the positive pole of a continuous current battery (20 to 25 milliampères is sufficient), the negative placed near by, the solution is decomposed into oxygen, hydrogen, bromin and sodium. These substances generate oxygen compounds of bromin, which give up their oxygen readily in the form of ozone, forming finally hydrobromic acid and bromin, partially gaseous, with a small amount of sodic compounds. All of these substances are extremely powerful disinfectants, and in a form hitherto unused in therapeutics and impossible to use in any other way than by electrolysis, and all in the atomic state. In non-suppurated tuberculosis a warm 1 to 20 solution is sufficiently powerful, but a titrated solution at 1 to 10 is necessary with a suppurating cavity. There is no local nor general reaction from its use, and immobilization and compression are superfluous, simple repose in bed being all that is needed. We add one of the observations, protracted osteomyelitis with very extensive suppurated cavity in the femur. The patient, age 34, was treated surgically with curettement, transplantation of bone, etc., eleven operations in all, each accompanied by severe hemorrhage, and all were ineffectual. When the electrolysis treatment was commenced the lower quarter of the femur was mined with a large cavity, the walls so thin that any further intervention would have broken them in. Sixteen applications of the medicated electrolysis entirely arrested the suppuration and the cavity filled up completely in the course of twenty-five. The temperature remained 36.5 to 37 degrees C. throughout. Fourteen months have elapsed since and there are no indications of a relapse. Another serious case was cured with two applications and no relapse in the three years since.

Study of the Morphology of the Blood and Lymph.—Botkin has added to his studies of the alterations undergone by the colorless elements of the blood, lymph and chyle, in *Virchow's Arch.*, cxxxvii and cxli, still another in cxlv. He states in this last that if a fresh drop of lymph is examined in the thermostat, highly magnified, all the corpuscles are seen to be undergoing the liveliest ameboid movements, producing the most varied shapes and appearances. After awhile these movements gradually decrease, the corpuscles swell, assuming the most remarkable shapes, and finally in the course of fifty to sixty minutes they vanish entirely. A clearer view of these "dissolution forms," as he calls them, is obtained by fixing and staining them. While it is easy to determine the variations in the number of the colorless corpuscles in the blood, by counting them simultaneously with the red corpuscles (with the erythrocytes remaining at a constant figure), this method entirely fails the investigator in studying the lymph, as they change so much and the erythrocytes dissolve, thus depriving him of any point of comparison. An abstract of his article in the *Cbl. f. Phys.* of November 14, remarks that his demonstration of the presence of red corpuscles in the lymph is especially important. The proportion of the red to the colorless corpuscles is found to vary in a surprising degree from 0.15 : 1 to 131.4 : 1. Botkin was therefore restricted to purely morphologic investigations, in which he found that there are four different processes by which the colorless corpuscles can pass out of existence. The conditions that determine the particu-

lar process are still unknown, but it is interesting to note in his fine illustrations how it is the nucleus in one and the protoplasm in another that is first affected, all ending however in utter extinction, the complete dissolution of the corpuscle in the lymph plasma. He considers the commencement of the process an indication of the death of the corpuscle. As long as it retains its vitality it opposes a certain resistance to the lymph plasma. This is extinguished with the death of the corpuscle and the plasma then destroys it. Although we know that there is a constant destruction of the leucocytes going on in the normally circulating lymph as in the blood, yet this destruction rapidly increases when it is removed from the body, even when it is kept at the same temperature. The number of colorless corpuscles seen to be undergoing destruction then rises from 4 to 50 per cent. The fourth process of dissolution is especially interesting. The corpuscles swell and the small lymphocytes become transformed into large colorless corpuscles. This explains the large number of leucocytes found in lymph which has been removed from the body for any length of time. In reality they are nothing but the "dissolution forms" of the small lymphocytes, swollen to a large size.

The British Law as to Unqualified Oculists and Aurists.—An interesting decision was rendered by the stipendiary magistrate at Leeds, Eng., Sept. 1, 1896, according to a report in the *Law Times* in a case wherein complaint had been made by the British Medical Defence Union that a Mr. Thomas Ison had falsely described himself to be an oculist and aurist, implying that he was registered as a medical practitioner under the Medical Act; and, moreover, that he had held himself out to the public to be by profession a surgeon under one of the provisions of that act. The magistrate dismissed the first part of the charges. He said that the informant, the general secretary of the above society, had admitted on cross-examination, that he had never known a qualified medical practitioner describes himself simply as an "oculist and aurist," those terms being generally used by persons whom he designated as "quacks." This, in the magistrate's opinion, destroyed the whole fabric of the informant's case so far as the first point at issue was concerned. Nor did the magistrate think that the fact that the defendant called his place "The Leeds Eye and Ear Dispensary," was a representation that he possessed a legal qualification, as a surgeon, but only that he was an optician by trade, or an unqualified practitioner in the treatment of the eye and ear. But Ison had affixed on a wall in the public street a placard on which, under the arms of the city, were printed the words, "Leeds Eye and Ear Dispensary, established 1871, 52 Great George Street, Mr. T. Ison, oculist and aurist," and on an inner door at Great George Street there was inscribed, "Consulting oculist and aurist." Furthermore, Ison quoted in his advertisements from paragraphs which had appeared in the newspapers in praise of a previously existing charitable eye and ear infirmary. The inference the magistrate irresistibly drew from these circumstances was that the "Leeds Eye and Ear Dispensary" was a recognized medical institution, and that the defendant himself was a recognized medical practitioner who had no regard for the unwritten law of the profession as to advertising, which, after all, the magistrate said, was a mere convention of no obligation—a rule of etiquette. Except for the references in the newspapers and on the walls to the "Leeds Eye and Ear Dispensary," he should probably have dismissed this second point in the case also; but, with a view to the guidance of the defendant in the future, the magistrate imposed a fine of five pounds sterling and costs.

Urea in Therapeutics.—Urea taken internally in large doses, often increases the diuresis and holds uric acid in solution. These effects should ensure it a prominent position in therapeutics. Its value has not been generally recognized hitherto, as the doses given have been too small to be effective. Klemperer has been testing it extensively in large doses, and has found its action prompt and decided. The best results were attained in cases of ascites and pleuritic effusions. In a few cases of ascites with cirrhosis of the liver, the amount of urine rose to five liters in the twenty-four hours, and large effusions in the abdomen rapidly disappeared. He classified the cases he has been able to observe carefully: 11 cases of ascites with cirrhosis of the liver, 63 per cent. benefited; 7 cases of pleuritic effusion, 57 per cent. benefited; valvular insufficiency, 13 cases, 38 per cent. benefited; muscular cardiac troubles, 41 per cent. benefited: Bright's disease, 9 cases, none benefited. It has no effect in diseases of the kidneys, which confirms again the physiologic assumption that the urea acts directly upon the renal epithelium, which it incites to stronger secretion. Klemperer ascribes the varying results attained in cases of pleuritic effusion to pressure of the effusion upon the kidneys in the unsuccessful cases. The results in heart troubles were also varying, probably from the same cause. A few patients with severe compensation disturbances on whom all other remedies had proved unavailing, eliminated astounding quantities of urine and their extensive edema rapidly disappeared. He refers these discrepancies again to the state of the kidneys; where they are too much degenerated by stagnation, the urea can not take hold. Albuminuria is therefore a contra-indication to the use of urea, although there were cases in which it produced no effect even when the urine was free from albumin. He recommends it in all cases of hydrops and ascites of non-renal origin, when other remedies fail. The effect is usually perceptible by the third or fourth day. If there is no improvement by the fifth day, he advises its discontinuance. The doses he administered were: Ureæ puræ, 10.0; aq. dest. 200. One tablespoonful every hour. If possible the entire amount to be taken in one day. Two days later he prescribes 15 gm. to 200 gm. and two days later 20 gm. to 200 gm. It is almost always well supported by the patient. If disagreeable to the taste he orders it to be taken in a wine glass of milk or Seltzer water. He usually continues it for fourteen days, the total amounting to 200 to 250 gm. although in certain cases he has given more than this. The largest amount, 920 gm. in sixty-five days, was in the case of a patient with chronic myocarditis. He has also found it very effective in preventing the formation of renal calculi, supplementing the dietetic measures, etc. He has administered it for this purpose in forty-two cases, and in none has it failed to produce a marked favorable effect. He begins as with hydrops, with a 5 per cent. solution. He also recommends a powder: Natr. bicarb., calc. carb., ureæ pur. āā 25 gm. M. f. pulv. In the forenoon and toward evening half a teaspoon. This medication applies to patients who have just passed through a colic. As a preventive measure he orders 100 to 150 gm. urea. The same regulations apply to patients who have formerly passed urates, and are now troubled by rheumatoid pains in the back and lumbar region. Urea is unable to afford relief during a colic. Its effect is also slight when the calculi are already formed, or when there is hematuria. Its effect in gout is limited to increasing the diuresis. His article in the *Deutsche Med. Woch.*, of November 19, concludes by quoting Senator's remark that the introduction of urea is a distinct gain to our pharmacopeia.

Duty of Committee of Lunatic.—Judge Clearwater, of the Ulster county court, N. Y., does credit to his name in a decision he handed down Oct. 14, 1896, in the case of Knapp's Estate. He says that it is the paramount duty of the committee of a lunatic to attend to his or her personal wants and comforts, and to furnish him or her, so far as the funds in his hands will allow, with not only all the necessaries of life, but all the proper recreation and amusements consistent with his or her former habit of living. It is his duty, likewise, to avail himself of medical advice, and all other reasonable means that may tend

to the restoration of his ward or the amelioration of his or her condition. The care, health and comfort of the lunatic alone are to be considered; and this without reference to the interests of the next of kin, heirs at law and expectants. The maintenance of a lunatic is by no means limited to the amount of his or her income, but his or her whole estate may be expended for his or her support, should that become necessary. A committee may arrange for the maintenance of the domestic establishment of a lunatic to the same extent as before the beginning of lunacy. He may also provide for the payment of the lunatic's customary contributions to the church which the person had been in the habit of attending, and to the making of a proper allowance to the lunatic, to be expended by said lunatic for gifts to friends, servants, dependents or in charity. The duties of the committee of a lunatic, and those of an executor or administrator, differ so widely that the rules governing the conduct of the one have but scant application to the duty of the other. As before stated, the duty of a committee is to the lunatic alone, whose well-being and comfort are of primary consideration; while executors and administrators are trustees for the benefit of creditors, legatees and next of kin, their duty being to conserve with great economy all the estate coming into their hands. Causes are not infrequently brought to the attention of courts of justice, the judge goes on to say, in which a relative, who gave little attention to the living invalid when the latter was most in need of affectionate tenderness and care, proves the reverse of indifferent in efforts to obtain possession of an estate, with the creation and accumulation of which he or she had absolutely nothing to do. This is an attitude which does not especially appeal to courts of equity, nor is it apt to unduly influence them to be astute in the effort to discover evidence of misconduct in acts which are equally consistent with innocence.

Gastric Ulcer with Perforation; Recovery.—In the *London Lancet*, October 10, Dr. Claude Taylor reports a case of the above nature as follows: A male aged 50 years, with good previous history, had for a month or more had vague symptoms of gastritis, such as a little pain after food and occasionally slight sickness. He had never vomited any blood, and having enjoyed such good health all his life he was unwilling to accept much in the way of advice or treatment. On July 14 he had his dinner as usual at 1 o'clock, consisting of a mixed diet of meat, etc., and afterward returned to his work out of doors. He was lifting barrels about, when at 4 o'clock he was suddenly seized with a violent pain in the epigastrium, which was so severe as to render him helpless; he was put to bed and poultices applied to the abdomen. He brought up a quantity of green, bile-stained vomit, but was only sick this once. "As I was visiting in another direction when sent for, I did not see him till 9 o'clock that evening. Then I found him pale and sweating, with the pulse somewhat quickened and the temperature slightly raised. The epigastrium and right hypochondrium were the seat of great pain and tenderness, especially below the tip of the ninth rib. The whole abdomen was very rigid. At no time was anything of the nature of a tumor to be felt. He had passed urine without much difficulty, and his bowels had been slightly moved. Suspecting the real nature of the case I ordered that he should have nothing by the mouth and should continue the hot fomentations. I saw him early next morning, when he said that he had slept fairly well and was feeling less collapsed, but the pain and tenderness remained, his temperature was 99 degrees F. and the pulse was 72. At 8:30 P.M. the temperature was 101 degrees, the pulse 72, full and soft, and the tongue was a good deal coated and dry. He had had two or three teaspoonfuls of weak milk in the afternoon by my direction as a test. His bowels had been again moved; as I have mentioned there was no further vomiting. The abdominal wall was less rigid and the pain was less severe, but diffused over the whole abdomen; the very tender area remained, but now the important sign of resonance over the liver area was present and I felt pretty confident of the diagnosis. Thinking that an operation would probably be the only means of saving the patient's life, I consulted Dr. George Findlay of Brailes on the matter, and he kindly came over to see him. By this time it was midnight and the patient feeling better, being hardly persuaded that the matter was serious, we decided to wait till the morning and even then to postpone operation so long as the improvement was maintained. I may say that the improvement did steadily continue, the pulse remained good but dropped to about 60 per minute, the pyrexia subsided, and at the end of five days from the onset the resonance over the liver had disappeared and the pain and tenderness nearly so. I thought an abscess would form, but there has been no sign of one. I have recently seen the man and though he feels rather weak still he gets about, sees after his business to a certain extent, and except for some flatulence has no gastric symptoms. Of course, he was fed entirely by the rectum, only moistening his mouth with a little water which he spat out again. Enemata of milk and egg were injected every four hours and the rectum was irrigated once a day with plain alkalised water. Though pepsin and hydrochloric acid had to be used for the enemata for the first three days (till I obtained some liquid pancreaticus from London) only one dose was rejected and the patient seemed to do well on them. The mixture was allowed to digest for a full half-hour and was then given him without being boiled, to allow peptonization to proceed in the bowel. This, then, was a case in which, if it had occurred in a hospital I should have advised immediate operation according to the opinion at present held by at least many surgeons. Operative measures, however, having failed in so many instances (three of which I have seen myself) the question arises: What is the best method to pursue, and particularly should an attempt be made to sew up the ulcer immediately its perforation is diagnosed, or should one refrain so long as the patient seems to be getting better rather than worse? I submit this account as indicating that the last course may be the best, but the surgeon would hold himself ready to operate at once if the symptoms were progressive. In my case I believe the absence of the necessity to move the patient more than a few yards after the onset had a considerable influence on his recovery."

Sea or Mountain Air Supplied at the Residence.—According to the *Gaz. d. Osp. e d. Clin.* of Nov. 19, a new process invented by the chemist Linde, compresses air until it contains 70 per cent. oxygen instead of the usual 25 per cent. A bottle of this air put up in the mountains or at the seashore will supply you at your residence with the healthiest and purest air in the world.

THE PUBLIC SERVICE.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending Dec. 19, 1896.

Surgeon L. B. Baldwin, detached from the "Newark" and ordered to the "Puritan."

P. A. Surgeon S. G. Evans, detached from the "Pinta" on reporting of his relief, and ordered to the naval hospital, New York.

P. A. Surgeon G. Rothganger, detached from the "Patterson" Dec. 25, and ordered to the "Pinta" per steamer of Dec. 29.

Change of Address.

Rodgers, D. F., from Ottawa, Kan., to Rooms 416-418 Deardorf Building, Kansas City, Mo.

Taylor, A. D., from Chicago to Williamsville, Ill.

Von Rehm, E., from 59 W. 105th St. to 1 W. 106th St., New York, N. Y.

LETTERS RECEIVED

Allport, Frank, Minneapolis, Minn.; Alden, C. H., Washington, D. C.; Abbey, C. D., Chicago, Ill.

Brown, Bedford, Alexandria, Va.; Biddle, J. G., Philadelphia, Pa.

Carter, E. C., Fort Harrison, Mont.; Coe, Henry W., Portland, Ore.; Caldwell, W. S., Freeport, Ill.

Elliott, A. R., New York, N. Y.

Ferguson & Goodnow, Chicago, Ill.; Furay, Charles E., Chadron, Neb.

Munn & Co., New York, N. Y.; Mountain Valley Springs Co., Hot Springs, Ark.

Pettingill & Co., Boston, Mass.

Richardson, H., Baltimore, Md.

Schering & Glatz, New York, N. Y.; Sharpe, N. W., St. Louis, Mo.; Souchon, Edmond, New Orleans, La.

Woody, Samuel E., Louisville, Ky.